Office of Utilities Regulation

National Water Commission

Review of Rates

Determination Notice

OFFICE OF UTILITIES REGULATION

October 1, 2013

DOCUMENT TITLE AND APPROVAL PAGE

1. **DOCUMENT NUMBER**: **2013/WAS/004/DET.003**

2. **DOCUMENT TITLE: National Water Commission Review of Rates – Determination Notice**

3. **PURPOSE OF DOCUMENT**

This Document outlines the Office's decision on the rates to be charged by the NWC for water and sewage services.

4. **APPROVAL**

This Document is approved by the Office of Utilities Regulation, and the decisions therein become effective on **October 3, 2013.**

On behalf of the Office:

……..
Maurice Charvis
Director General

Date: October 1, 2013

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ACRONYMS AND ABBREVIATIONS

2008 Tariff Determination Notice	-	NWC Review of Rates Determination Notice dated April 28, 2008: Document No. WAT 2008/01
ANPAM	-	Annual reset for Price Adjustment Mechanism
CAPM	-	Capital Asset Pricing Model
Commission	-	National Water Commission
CPI	-	Consumer Price Index
CReW Project	-	Caribbean Regional Fund for Wastewater Management (CReW)
CWTC	-	Central Wastewater Treatment Company Limited
EDWT	-	Economic Development Wastewater Tariff Scheme
FE	-	Foreign Exchange
GDP	-	Gross Domestic Product
Government	-	Government of Jamaica
IDB	-	Inter-American Development Bank
IG	-	Imperial Gallon
KMA	-	Kingston Metropolitan Area
KSA	-	Kingston and St. Andrew Area
KWh	-	Kilowatt Hour
Migd	-	Million Imperial Gallons daily
NBV	-	Net Book Value
NEPA	-	National Environmental Planning Agency
NRW	-	Non-Revenue Water
NWC	-	National Water Commission
O&M	-	Operating and Maintenance
OUR/Office	-	Office of Utilities Regulation
PAM	-	Price Adjustment Mechanism
UFW	-	Un-accounted for water

EXECUTIVE SUMMARY

INTRODUCTION

1.1 On March 11, 2013 the National Water Commission ("NWC/Commission") submitted a proposal to the Office of Utilities Regulation ("OUR/Office") for an adjustment to its rates and service as well as its operational standards. The initial review of the application indicated that some of the content had been submitted under confidential seal. The NWC was therefore requested to resubmit its application removing the confidential seal and if necessary also provide a redacted version of the application excluding commercially-sensitive information for publication.

1.2 The Commission resubmitted its application without the confidential markings on April 10, 2013.

1.3 Further examination of the NWC's application also revealed that the waste water separation methodology did not result in the NWC coming to a conclusion on a separate wastewater tariff, instead they proposed that the best approach is to keep water and wastewater tariff equal. The OUR however believes that the NWC should provide differential rates for water and sewage. The OUR therefore requested that NWC provides this break-out as well as additional raw data even while the OUR continued its review of the application. The provision of this additional information was protracted with the last submission being made on July 18, 2013. This resulted, in the review taking longer than the three-month period that would have applied had the application been submitted in the required format and contained all the requisite information at the initial submission of the application. Notably, as well, the Office also by way of correspondence dated September 6, 2013 provided NWC with an advanced copy of the draft determination notice as part of its normal consultation process to which NWC responded with substantial comments that required additional analysis and consideration.

1.4 NWC proposed two options in its application:

- ***Full cost recovery in each year*** – The Commission proposed that this would allow it to cover its full cost of service from 2014 to 2018. If the OUR approved this option, NWC's current tariff would need to be increased by 39.7% to meet this year's cost of service, taking April 2013 as the base date. This would be achieved if a 27.7% increase is applied to the base rate and the X-Factor, currently 12%, is set at zero for 2014 and gradually change from 4.1% in 2015 to 17.4% in 2018, the K-factor variable is also to remain at 27%.

- ***Zero return on equity initially*** – In this option, the Commission proposed to earn zero return on equity until it starts to achieve efficiency in 2015. However, it should be allowed to cover its cash costs each year and earn a full return on equity for the last two (2) years of the regulatory period provided that efficiencies are achieved as planned. For this option, the increase above the current tariff would be 21.7% which is achieved by applying 11.7% to the base rate, removing the X-Factor for the first three (3) years of the tariff period and then making it 2.3% and 7.4% for the last two (2) years.

1.5 The Commission has indicated that Option Two is preferred.

1.6 NWC PROPOSALS

NWC estimated that its cost for the year 2013/2014 as determined from a five-year average is as shown in Table 1.1 below:

Table 1.1 NWC proposed costs

Category/Year	2013/2014 $'000
Salaries, wages and related cost	**5,532,753**
Repairs and Maintenance	**3,109,668**
Administration	**4,876,714**
Telephone	**146,327**
Fuel & lubricants	**321,811**
Electricity	**6,040,216**
Purchases – water	**285,787**
Soapberry cost	**1,299,996**
Total OPEX	**21,613,271**

1.7 NWC posited that the total revenue required to cover the above budget cost is as shown in Table 1.2:

Table 1.2 NWC proposed revenue requirement

Category	NWC's Proposal ($)'000
Total operating costs	**21,613,271**
Loan Interest	**1,392,897**
Depreciation	**8,697,658**
Taxation	**0**
Return on equity	**4,327,504**
Total revenue requirement	**36,031,331**

1.8 NWC also proposed that the existing tariff structure (Price Cap Methodology) remains in place for the next five (5) years.

1.9 **Price Adjustment Mechanism (PAM)**

NWC has requested that the tariff continues to be indexed to input price increases through the PAM. However, it proposed that the PAM be restructured to include five indices that best track changes in its costs. The indices proposed are foreign exchange, consumer price index, electricity price, wage index and asset revaluation index. NWC argued that the present weights of the PAM do not adequately reflect its cost components and proposed that it be adjusted as follows:

Table 1.3: Proposed PAM weights

Index	Existing	Proposed
Exchange rate	25%	4%
Electricity	24%	13%
CPI	51%	31%
Wage Index	N/A	15%
Asset Revaluation Index	N/A	36%

1.10 The NWC requested that the X-Factor be set to zero for the first three (3) years of the tariff period.

Table 1.4 outlines NWC's proposed X-factor schedule.

Table 1.4: Proposed X-Factor

Years	2014	2015	2016	2017	2018	2019
X-Factor	0.0%	0.0%	0.0%	-2.3%	-7.4%	-11.8%

1.11 K-Factor

The NWC requested that the K-Factor percentage remains the same as the ones outlined in the NWC Review of Rates Determination Notice dated April 28, 2008: Document No. WAT 2008/01 (the "2008 Tariff Determination Notice"). The K-Factor is to be calculated on the bill balance after the X-Factor is deducted. The Commission further proposed that the schedule of the K-factor continues across tariff regimes so as to ensure that funds are available to service loans and to ensure that NWC meets its long term efficiency targets. The NWC also requested that the tariff reporting requirement on the K-Factor remains the same.

1.12 Separation of water and wastewater rates

Further to the NWC tariff proposal, the OUR in a letter dated May 9, 2013 reminded the NWC of its earlier stipulation regarding separate rates and requested that the Commission present a separate cost-base tariff proposal for wastewater. The NWC responded by letter dated July 18, 2013 and proposed that the Long Run Average Incremental Cost (LRAIC) methodology be used to estimate cost reflective tariffs. The NWC indicated the following:

Average wastewater tariff for Kingston and St. Andrew (KSA) is proposed to be J$1,700 per 1,000 gallons a 108% increase Average wastewater tariff for other systems is proposed to be J$1,126 per 1,000 gallons a

38% increase.

Tables 1.5 and 1.6 outlines the NWC's proposed wastewater tariff by customer bands.

Table 1.5: Proposed Wastewater Tariffs for KSA, by Customer Band

Band	Tariff Effective 1st April 2013	New Tariff Proposed	Increase
Residential			
Block 1: 0 to 3,000 IG/month	328	682	108%
Block 2: 3,001-6,000 IG/month	578	1,203	108%
Block 3: 6,001 to 9,000 IG/month	624	1,299	108%
Block 4: 9,001 to 12,000 IG/month	796	1,657	108%
Block 5: 12,001 to 20,000 IG/month	992	2,064	108%
Block 6: above 20,000 IG/month	1277	2,657	108%
Commercial	1229	2,558	108%
Condominium	610	1,269	108%
School	492	1,023	108%
Average*	817	1,700	108%
***Average is estimated by dividing total billed in wastewater charges (including PAM, K-factor, and X-factor), by total imperial gallons of wastewater discharged billed.**			

Table 1.6: Proposed Tariff for other wastewater systems, by Customer Band

Band	Tariff Effective 1st April 2013	New tariff Proposed	Increase
Residential			
Block 1: 0 to 3,000 IG/month	328	452	38%
Block 2: 3,001-6,000 IG/month	578	796	38%
Block 3: 6,001 to 9,000 IG/month	624	860	38%
Block 4: 9,001 to 12,000 IG/month	796	1,097	38%
Block 5: 12,001 to 20,000 IG/month	992	1,367	38%
Block 6: above 20,000 IG/month	1277	1,759	38%
Commercial	1229	1,694	38%
Condominium	610	840	38%
School	492	678	38%
Average*	817	1,126	38%
***Average is estimated by dividing total billed in wastewater charges (including PAM, K-factor, and X-factor), by total imperial gallons of wastewater discharge billed.**			

The NWC requested that the KSA tariff be revised when the tariff for Central Wastewater Treatment Company Limited (CWTC), the operators of the Soapberry wastewater treatment plant, is approved by the OUR, in a way that the Soapberry tariff can be treated as a pass-through cost for the KSA system.

OFFICE DETERMINATION

1.13 Estimated Expenditures

The Office has determined that the allowable expenditures are as shown in Table 1.7 below.

Table 1.7 Breakouts of the Office Determined Total Expenses

Details	Water	Sewerage	TOTAL
	'000	'000	'000
Total Salaries	$4,748,760	$1,339,754	$6,088,515
Total R&M	$1,743,447	$545,221	$2,288,669
Total administration	$2,407,176	$724,932	$3,132,108
Electricity	$6,188,048	$372,723	$6,560,771
Telephone	$86,342	$26,371	$112,713
Fuel & Lubrication	$213,156	$56,341	$269,497
Regulatory fees	$37,746	$37,746	$75,492
Water Purchase	$296,435	$0	$296,435
Soapberry Cost	$0	$971,497	$971,497
Loan Interest	$716,351	$213,975	$930,326
Depreciation	$2,322,848	$693,838	$3,016,686
TOTAL	**$18,760,310**	**$4,982,397**	**$23,742,709**

1.14 Revenue Requirement

As shown in Table 1.8 below the Office has determined that the equity base is $15.73B, when the cost of equity is applied to the Office- determined equity base and allowances are made for corporation taxation of 33.33% it yields a Pre-Tax return on equity of $2.42B.

The revenue requirement determined by the Office is $26.16B.

Table 1.8 Breakout of Revenue Requirement

Building Blocks	Water	Sewerage	Total
	$'000	$'000	$'000
Total Expenses	18,760,310	4,982,398	23,742,709
Equity base	12,110,536	3,617,433	15,727,969
cost of equity real	0	0	0
return on equity	1,242,541	371,149	1,613,690
Taxes	618,822	188,011	806,833
Pre Tax return on equity	1,856,484	564,038	2,420,522
Total Revenue Requirement	20,616,794	5,546,436	26,163,231

1.15 Estimated Revenues

The Office has taken the audited operating revenues for both water and sewerage services (net of PAM, K-Factor and X-Factor) for the financial year 2012/2013 and made adjustments for changes in the PAM variable up to July of 2013. The adjustments to the audited 2012/2013 operating revenue as shown in Table 1.9 below give an estimated normalised amount of revenues totalling $22.5B which is allocated $17.4B to water services and $5.13B to sewerage services.

1.16 Revenue Shortfall

Table 1.9 below shows the Office's computation of expected revenue shortfall resulting from the Commission's operation.

Table 1.9: Revenue shortfall

Category	Water	Sewerage	Amount $'000
Total revenue requirement	$20,616,794	$5,546,436	**$26,163,231**
Projected Revenue	$17,380,489	$5,132,774	**$22,513,263**
Shortfall	$3,236,305	$413,662	$3,649,969
Increase	**19%**	**8%**	**16%**

An overall increase of 16% is allowed to the NWC. This translates into a 19% increase in water rates and an 8% increase in sewerage rates. Since this is the net amount required in the adjusted test year, by implication the X-factor would be reset to zero.

1.17 Summary of Decisions

The Office has determined that the effective increase of the NWC rates shall be 19% in water rates and 8% in sewerage rates.

The water and sewerage rates shall be as shown in Table 1.10 below and they become effective as at October

3, 2013.

The Office has determined that in order to increase and encourage private investments, this tariff regime will be in effect for five (5) years that is, 2013-2018.

The Office has further determined that the rates for services supplied to ships are to be charged at the commercial rates.

Table 1.10 Effective Rates

Rates and Charges	Effective rate inclusive of PAM April 2013	Effective Increase 2013/2014
Service Charges		
Where the size of the meter does not exceed		
5/8 inch/15mm	$574.86	$684.09
3/4 inch/20mm	$1,179.94	$1,404.13
1 inch/25mm	$1,543.05	$1,836.23
l¼ inch/30mm	$2,904.57	$3,456.43
1 1/2 inch/40mm	$2,904.57	$3,456.43
2 inch/50mm	$4,114.74	$4,896.54
3 inch/75mm	$7,473.21	$8,893.12
4 inch/100mm	$12,072.04	$14,365.73
6 inch/150mm	$18,395.47	$21,890.61
WATER RATES		
Domestic Consumers (Imperial Metered)—		
For up to 3,000 gallons at a rate of	$327.75	$390.02
For the next 3,000 gallons at a rate of	$577.81	$687.59
For the next 3,000 gallons at a rate of	$623.87	$742.41
For the next 3,000 gallons at a rate of	$796.29	$947.59
For the next 8,000 gallons at a rate of	$991.73	$1,180.16
Over 20,000 gallons at a rate of	$1,276.55	$1,519.09
Domestic Consumers (Metric Metered)—		
For up to 14,000 litres at a rate of	$72.06	$85.75
For the next 13,000 litres at a rate of	$127.06	$151.21
For the next 14,000. litres at a rate of	$137.20	$163.27
For the next 14,000 litres at a rate of	$175.12	$208.40
For the next 36,000 litres at a rate of	$218.07	$259.50
Over 91,000 litres at a rate of	$280.72	$334.05
Commercial and Industrial Consumers—		

Imperial metered	$1,229.00	$1,462.51
Metric metered	$270.22	$321.57
Condominiums—		
Imperial metered	$609.66	$725.49
Metric metered	$134.04	$159.51
Primary Schools—		
Imperial metered	$491.63	$585.04
Metric metered	$108.11	$128.65
SEWAGE RATES		
Domestic Consumers (Imperial Metered)—		
For up to 3,000 gallons at a rate of	$327.75	$353.97
For the next 3,000 gallons at a rate of	$577.81	$624.04
For the next 3,000 gallons at a rate of	$623.87	$673.78
For the next 3,000 gallons at a rate of	$796.29	$860.00
For the next 8,000 gallons at a rate of	$991.73	$1,071.07
Over 20,000 gallons at a rate of	$1,276.55	$1,378.67
Domestic Consumers (Metric Metered)—		
For up to 14,000 litres at a rate of	$72.06	$77.83
For the next 13,000 litres at a rate of	$127.06	$137.23
For the next 14,000. litres at a rate of	$137.20	$148.18
For the next 14,000 litres at a rate of	$175.12	$189.13
For the next 36,000 litres at a rate of	$218.07	$235.51
Over 91,000 litres at a rate of	$280.72	$303.18
Commercial and Industrial Consumers—		
Imperial metered	$1,229.00	$1,327.32
Metric metered	$270.22	$291.84
Condominiums—		
Imperial metered	$609.66	$658.43
Metric metered	$134.04	$144.76
Primary Schools—		
Imperial metered	$491.63	$530.96
Metric metered	$108.11	$116.76
MISCELLANEOUS FEES		**Effective 2013/2014**
Disconnection and Reconnection Fee—	$798.00	$798.00

Domestic Unmetered Services (Locked)	$3,547.00	$3,547.00
Removal and Replacement of Service		
(Unmetered)	$798.00	$798.00
Domestic Metered Service (Locked)		
Domestic Metered Service Removed	$7,099.00	$7,099.00
and Replaced ~/s inchll5mm and		
% inch/2Omm		
	$10,652.00	$10,652.00
Domestic Metered Service Removed and		
Replaced 1 inch/25mm and over	$798.00	$798.00
Commercial Metered Service (Locked)		
	$10,652.00	$10,652.00
Commercial Metered Service Removed and Replaced		
Illegal Connections, Domestic and		
Commercial, the actual cost of		
Leak Detection and/or Repair, the actual cost of		

Rates for ships are to be charged at the commercial rates

1.18 Bill Impact

Tables 1.11and 1.12 shows the bill impact of the rate changes on a typical bill

Table 1.11: Typical Residential customer bill with water and sewerage services

	Current bill	**New bill**	**Change**
	$	$	
3000 gallons			
Service Charge	$574.00	$684.00	
Water charge	$981.00	$1,170.00	
Sewerage charge	$981.00	$1,059.00	
PAM	$82.17	$0.00	
X- Factor	$314.18	$0.00	
K-factor	$622.08	$407.82	
Total bill	**$2,926.06**	**$3,320.82**	**13%**
7000 gallons			

Service Charge	$574.00	$684.00	
Water charge	$3,340.00	$3,973.00	
Sewerage charge	$3,340.00	$3,604.00	
PAM	$235.03	$0.00	
X- Factor	$898.68	$0.00	
K-factor	$1,779.39	$1,156.54	
Total bill	**$8,369.74**	**$9,417.54**	**13%**

Table 1.12: Typical Residential customer bill with water services only

Typical Residential Customer bills			
	Current bill	New bill	Change
	$	$	
3000 gallons			
Service Charge	574	684	
Water charge	981	1170	
PAM	50.38	0	
X-factor	192.65	0	
K-factor	381.44	259.56	
Total bill	**1794.17**	**2113.56**	18%
7000 gallons			
Service Charge	574	684	
Water charge	3,340.00	3,976.00	
PAM	126.81	0.00	
X- Factor	484.90	0.00	
K-factor	960.10	652.40	
Total bill	**4,516.01**	**5,312.40**	**18%**

1.19 Price Adjustment Mechanism

The PAM seeks to compensate NWC monthly for movements in the costs of inputs over which it has no control. Currently, the PAM corrects for movement in the Consumer Price Index (CPI), Jamaican dollar exchange rate relative to the US dollar, and electricity price. The PAM is applied to customer bills on a monthly basis. The PAM formula is as follows:

$$PAM = [w\_fe*\Delta FE+w\_cpi*\Delta CPI+w\_ec*\Delta kwh]$$

Where,

ΔFE is the percentage change in the J$/US$ exchange rate;

ΔCPI is the percentage change in the Consumer Price Index;

Δkwh is the percentage change in the kilowatt hour charge for electricity;

w_fe is the weight associated with J$/US$ exchange rate;

w_cpi is the weight associated with the Consumer Price Index; and

w_ec is the weight associated with the kilowatt hour charge for electricity.

The Office has determined that the weights for the PAM are as shown in Table 1.13 below:

Table 1.13: Effective Pam Weights

Index	Current Weight	NWC Proposed Weight	OUR Determined Weight
CPI	47%	31%	51%
Electricity	25%	13%	25%
Foreign Exchange	28%	4%	24%
Salary		15%	0%
Asset Revaluation		36%	0%
Total	**100%**	**100%**	**100%**

The Office has also determined that all the indices are to be applied on a monthly basis. The PAM will also be reset on its anniversary date at which time the new base values for the three (3) components will be set. The annual reset for PAM (ANPAM) will be based on the following formula:

ANPAM = $[w_{fe}*\Delta FE + w_{cpi}*\Delta CPI + w_{ec}*\Delta kwh]*100$

where w_{fe} is the weight for foreign exchange, w_{cpi} is the weight for CPI and w_{ec}, the weight for kwh and

Δ is the percentage change in the respective variables, that is, new base value of each variable less the old base value.

In light of the foregoing, the new PAM formula will remain unchanged.

$$PAM = \left[w_{fe} * \Delta FE + w_{cpi} * \Delta CPI + w_{ec} * \Delta kwh\right] * 100$$

The base values for the PAM indices are chosen as at July 2013 and are as shown below:

Electricity: $31.41/kWh;

Exchange Rate: J$101.76 to US$1.00; and
CPI All divisions: 200.9.

The PAM will also be reset at its anniversary (1st August) at which time the new base values for each component will be set. The rates at the beginning of each year shall be derived by Base rate*(1 +ANPAM ±Z).

1.20 K- Factor Application and Recovery through X-Factor

The Office has allowed the K-factor programmes to be funded by the application of the K-factor. The X-factor is to be calculated as a deduction from the bill after the normal rates and PAM. The K-factor is to be calculated on the bill balance after the X-factor is deducted. Table 1.14 below outlines the applicable K-factor and X-factor variables.

Notwithstanding, the Office may make adjustments to the schedule outlined in Table 1.14 two (2) years after its implementation to properly align cash inflows with financing requirements.

NWC shall account for the deemed K-factor cash inflow calculated on the basis of 92% of the K-factor billing. A separate bank account shall be instituted to accommodate the cash flows from the K-factor and monthly report of balances and changes should be submitted to the Office within forty-five (45) days of each reporting period. K-factor revenues shall be deemed collected within forty-five (45) day after billing.

Table 1.14 Applicable K-factor and X-Factor variables

Year Ending March	2014	2015	2016	2017	2018
K-Factor	14%	14%	14%	14%	14%
X-Factor	-	-5.5%	-9.7%	-12.7%	-15.2%

1.21 Manufacturing Sector – Economic Development Wastewater Tariff

The Office is recommending that the NWC reinstates the continuance of the sewerage rebate under the Economic Development Wastewater Tariff Scheme (EDWT). The Office is further directing the NWC to undertake a general review of the conditions under which the EDWT is applied to ensure equity within the sector and to eliminate any discrimination that may arise by its application to one entity and omission in another. This review should include consultations with stakeholders within the sector and shall be completed within the first three (3) months of the effective date of this Determination.

1.22 Path Programme for Water

The Office views this as a policy decision that is outside of the OUR's regulatory remit. The NWC is encouraged to explore the possibility of such a request with the relevant government ministries.

1.23 Energy Surcharge

The Office is not disagreeing with the principle of applying an energy surcharge and notes that NWC is entitled to make such a proposal. It is therefore entirely within the NWC's discretion to submit a proposal substantiated by the relevant information for the Office's consideration.

1.24 Seasonal Tariff

As with the energy surcharge, the Office's position is that before it can consider the matter of a seasonal tariff, the NWC should provide a properly substantiated proposal before the Office.

1.25 Security Deposit

The Office has concluded that there is no need for the NWC to resort to a security deposit from customers in order to secure payment.

1.26 Charges for delinquent and Inactive Customers

NWC has not provided the Office with information to indicate that these proposals have been taken beyond the stage of concepts. Notably, it is not clear as to what the definition of an inactive customer is, or how a delinquent account differs from one that would be liable for a late payment charge. The Office will therefore not approve a charge for delinquent account or inactive account at this time. NWC may choose to provide more well-defined proposals supported by a charging regime at the next tariff review.

Late Fee

The Office will in principle approve the application of a late fee to be included in the Commission's tariff structure for the calendar year 2014/2015. The Commission is required to provide the Office with a detailed plan indicating inter alia: definition of late, applicable cost, mode of implementation and explanation of how this will relate to disconnection and the charging of a disconnection fee.

1.27 Reconnection and Disconnection Fee

The reconnection and disconnection fees to be applied by the Commission remains unchanged and is outlined in Table 1.10 above.

1.28 Quality of Service Standards

The following Guaranteed Standards become effective on **October 3, 2013**:

Table 1.15 Effective Guaranteed Standards

CODE	FOCUS	DESCRIPTION	PERFORMANCE
WGS1	Access	Connection to supply	Maximum time of ten (10) working days to connect supply and install meter after establishment of contract. **Compensation type: Claim**
WGS2	Delivery of bills	Issue of first bill	Maximum time of forty (40) working days after connection of supply and installation of meter. **Compensation type: Claim**
WGS3	Appointments	Keeping appointments	Must make and keep an appointment at customers request and must notify customer within reasonable time prior to appointed time, if the appointment will not be kept. **Compensation type: Claim**
WGS 4(a)	Complaints	Acknowledgement	Maximum of five (5) working days to acknowledge customer written complaints, after receipt. **Compensation type: Claim**
WGS (4b)	Complaints	Investigations	Maximum time of thirty (30) working days from the date receipt of the complaint to complete investigation and respond or provide an update. **Compensation type: Claim**
WGS 5	Disconnection	Wrongful Disconnection	Where the NWC disconnects a supply that has no overdue amount or is currently under investigation by the OUR or the NWC and only the disputed amount is in arrears. **Compensation type: Automatic**
WGS 6	Account status	Issue of account status	Meter to be read on same day customer is moving, if on a weekday (within two (2) working days of move if on a weekend) providing five (5) working days' notice of move is given. Maximum time of fifteen (15) working days to provide final bill after move and forty-five (45) days to refund credit balances. **Compensation type: Claim**
WGS 7	Water meters	Meter installation	Maximum of thirty (30) working days to install

CODE	FOCUS	DESCRIPTION	PERFORMANCE
			meter on customer's request. **Compensation type: Claim**
WGS 8	Water meters	Repair or replacement of faulty meters	Maximum time of twenty (20) working days to verify, repair or replace meter after defect is identified or reported. **Compensation type: Automatic**
WGS 9	Water Meters	Changing Meters	NWC must provide customer with details of the date of the change, the reading on the old meter on the day and serial number of the new meter. **Compensation type: Claim**
WGS 10	Water meters	Meter reading	Should NOT be more than two (2) consecutive estimated bills (where company has access to meter). **Compensation type: Automatic**
WGS10(b) **(NEW)**	Water Meters	Exceptional Meter Readings	Where consumption increases by at least fifty percent (50%), then the customer is to be alerted within one billing period. **Compensation Type: Claim**
WGS11	Reconnection	Reconnection after payment of overdue amount	Current: Maximum of twenty-four (24) hours to restore supply. **Compensation type: Automatic**
WGS12	Reconnection	Reconnection after wrongful disconnection	NWC must reconnect a supply it inadvertently disconnected within eight (8) hours of being notified of the error. **Compensation type: Automatic**
WGS13	Compensation	Payment of compensation	Maximum of thirty (30) working days to process and apply credit to customer's account. **Compensation Type: Automatic**
WGS 14 **(NEW)**	Estimation of Consumption	Method of Estimation	An estimated bill should be based on the average of the last three (3) actual readings. **Compensation type: Automatic**
WGS 15 **(NEW)**	Billing Adjustment	Timeliness of adjustment to customer's account	Where necessary, customer must be billed for adjustment within three (3) months: (i) identification of error, or (ii) subsequent to replacement of faulty meter

CODE	FOCUS	DESCRIPTION	PERFORMANCE
			Compensation Type: Claim

1.29 New Guaranteed Standards

The Office has included the new guaranteed standards below in the current scheme:

1. Exceptional Meter Readings – Where the consumption increases by at least fifty percent (50%), then the customer is to be alerted within one (1) billing period.

2. Estimation of Consumption – An estimated bill should be based on the average of the last three (3) actual meter readings.

3. Billing Adjustment - Where necessary, customer must be billed for adjustment within three (3) months (i) of identification of error, or (ii) subsequent to replacement of faulty meter.

1.30 Amended Standards

The Office has amended the standards below as follows:

- **WGS 2 – Issue of First Bill**

Maximum of forty (40) working days after connection of supply and installation of meter

- **WGS 4(b) – Complaints**

Maximum time of thirty (30) working days from the date of receipt of complaint to complete investigation and respond or provide an update

- **WGS 5 – Wrongful Disconnection**

Where the NWC disconnects a supply that has no overdue amount or is currently under investigation by the OUR or the NWC and only the disputed amount is in arrears

- **WGS 6 – Account Status**

Meter to be read on same day customer is moving, if on a weekday (within 2 working days of move if on a weekend) providing 5 working days' notice of move is given. Maximum time of 15 working days to provide final bill after move and 45 days to refund excess amounts remaining on the account.

- **WGS 8 – Repair or replacement of faulty meters**

Maximum time of twenty (20) working days to verify, repair or replace meter after defect is identified or reported.

1.31 Compensation Mechanism

The Office has determined that the compensation for breach of a Guaranteed Standard will be four (4) times the applicable service charge.

Where applicable, customers must submit claims within 120 working days after the breach is committed

1.32 Special Compensation

In the case of Reconnection after payment of Overdue Amounts, Wrongful Disconnection and Reconnection after Wrongful Disconnection, the compensation will be six (6) times the applicable service charge

Breaches of individual standards will attract compensation up to six (6) periods of non-compliance.

1.33 Mid-tariff Review

The Office will be conducting a mid-tariff review on the Guaranteed Standards Scheme.

CHAPTER 2: BACKGROUND

2.0 The Commission is the primary provider of potable water and sewerage services in Jamaica. The Commission reports that it provides 73% of household with in-house water supply and is aiming to increase this to 85% over the next ten (10) years. The Commission also reports that only 23% of its customers are provided with sewerage services. It proposes to increase the number of towns with central sewerage system from four to twenty.

2.1 The Commission asserts that it will achieve this objective by implementing its Strategic Transformation Plan (the Plan) The Commission claims its Plan is paramount to enhancing efficiency as it is predicated on revamping the way it carries out its operations. The Plan outlines the Commission's reformation plans for: leadership and performance, risk management and mitigation, internal control, and improving the physical facilities and operations. The Commission noted that the International Development Bank has provided financial aid to assist it in developing these plans. The Plan will be revised periodically to ensure that it fundamentally and positively impacts on the operation of the organization and its service to Jamaica in the years ahead.

2.2 Legal and Regulatory Framework

The NWC is a body corporate established by virtue of Section 3 of the National Water Commission Act ("the NWC Act"). Pursuant to Section 4 (1)(d) & (e) of the NWC Act, the function of the NWC inter alia, is to "*within the limits of its resources provide and improve water supply services throughout the Island*" and "*maintain and operate water supply services provided by the Commission*".

Pursuant to Section 4 of the Office of Utilities Regulation Act (the "OUR Act") the Office is empowered to regulate the supply and distribution of water and the provision of sewerage services. The Office's authority to approve rates is set out in Sections 11 and 12 of the OUR Act. Sections 11 and 12 of the OUR Act provide as follows:

"11. (1) Subject to subsection (3), the Office may, either of its own motion or upon application made by a licensee or specified organization (whether pursuant to subsection (1) of section 12 or not) or by any person, by order published in the Gazette prescribe the rates or fares to be charged by a licensee or specified organization in respect of its prescribed utility services.

(2) For the purposes of this section, the Office may conduct such negotiations as it considers desirable with a licensee or specified organization, industrial, commercial or consumer interests, representatives of the Government and such other persons or organizations as the Office thinks fit.

(3) The provisions of subsections (1) and (2) shall not apply in any case where an enabling instrument specifies the manner in which rates may be fixed by a licensee or specified organization.

12. (1) Subject to subsection (2), an application may be made to the Office by a licensee or specified

organization by way of a proposed tariff specifying the rates or fares which the licensee or specified organization proposes should be charged in respect of its prescribed utility services and the date (not being earlier than the expiration of thirty days after the making of the application) on which it is proposed that such rates should come into force (hereinafter referred to as the specified date).

(2) As respects a specified organization referred to in section 13 an application made under subsection (1) of this section shall take into account the provisions of section 13.

(3) Where an application by way of a proposed tariff is made under subsection (1) notice of such application and, if so required by the Office, a copy of such tariff shall be published in the Gazette and in such other manner as the Office may require.

(4) A notice under subsection (3) shall specify the time (not being less than fourteen days after the publication of the notice in the Gazette) within which objections may be made to the Office in respect of the proposed tariff to which the notice relates.

(5) Subject to the provisions of this Act, the Office may, after the expiration of the time specified in the notice under subsection (3), make an order either –

(a) confirming the proposed tariff without modifications or with such modifications as may be specified in the order; or

(b) rejecting the proposed tariff.

(6) If, after publication of the notice of an application in accordance with subsection (3), no order under subsection (5) has been made prior to the specified date, the proposed tariff shall come into force on the specified date.

(7) An order confirming a proposed tariff shall not bring into operation any rates or fares on a date prior to the date of such order."

CHAPTER 3: NWC'S PROPOSALS

3.1 INTRODUCTION

On March 11, 2013 the NWC submitted a proposal to the OUR for an adjustment to its rates and service and operational standards. On review of the application, it was observed that aspects of it had confidentiality markings. NWC was therefore requested to remove the confidentiality cover to allow the document to be published on the OUR website and for public consultation. The Commission resubmitted a revised tariff application on April 10 2013 in a format that allowed for publication and public consultation.

3.2. The OUR also observed during further review of the application that the NWC had again proposed an equal per 1000 gallons tariff for potable water and sewerage treatment. This was contrary to the OUR's explicit request that separate tariff should be proposed for these services. Consequently NWC was requested to provide the Office with separate tariffs for these services with the supporting costs. NWC's submission with respect to this separation was received on July 9, 2013. In the said proposals, NWC proposed different rates for wastewater based on location, $1,700 per 1000 gallons for the KSA system and $1,126 for the systems located in other parishes across Jamaica.

Tariff Options

3.3. The NWC indicated two tariff options in its tariff application.

- **Option A** - Full Cost Recovery in each year in order to allow the NWC to cover its full cost of service each year, from 2014 to 2018. The Commission asserted that if this option is implemented then the tariff will be increased in April 2013 to meet this year cost of service. This increase is achieved by applying a 27.7% increase in the base tariff, and removing the X-Factor for 2014. This tariff proposal is based on the premise that a 16% real pre-tax return on equity is achieved each year by the NWC.

- **Option B** - In this option, NWC recovers its operational cost each year but is only permitted to achieve full return on equity for two years of the approved tariff period. It is predicated on the following assumptions:

  a. Zero return on equity initially until the Commission begins to achieve efficiencies in 2015.
  b. The NWC is allowed to cover its cash cost in each year.
  c. The Commission is allowed to earn a full return on equity for at least two years of the regulatory period, provided that efficiencies are achieved as planned.

  Under this, scenario, the tariff increase in 2013 is 29%. This would be achieved by applying a 19% increase in the base rates and removing the X-factor for 2014.

3.4 The NWC has indicated that tariff Option B is its preferred option and therefore its tariff proposal is built on the premises set out in tariff Option B.

Separation of rates for wastewater tariffs

3.5 The Office has expressed the view in previous tariff reviews that it is desirable to determine rates for producing potable water and waste water treatment. Apart from the obvious benefits of more cost oriented rates, the OUR is of the view that this approach *inter alia*, improves transparency and allows for the determination of the viability of investments in either sector. It has therefore insisted that this process should commence in this rate review.

The Commission in its submission, responding to the OUR's insistence on separated rates, suggested that sewerage rates be derived on a Long Run Incremental Cost (LRIC) basis. NWC claims that given its plans to double wastewater services from 18% to 37% over the regulatory period, it has taken into consideration the forward looking long run marginal costs estimates based on the structure of its sewerage system.

3.5.1 Average wastewater tariff for KSA is proposed to be J$1,700 per 1,000 gallons a 108% increase Average wastewater tariff for other systems is proposed to be J$1,126 per 1,000 gallons a 38% increase.

Tables 3.1 and 3.2 outline the NWC's proposed wastewater tariff by customer bands

Table 3.1: Proposed Wastewater Tariffs for KSA, by Customer Band

Band	**Tariff effective 1st April 2013**	**New Tariff Proposed**	**Increase**
Residential			
Block 1: 0 to 3,000 IG/month	328	682	108%
Block 2: 3,001-6,000 IG/month	578	1,203	108%
Block 3: 6,001 to 9,000 IG/month	624	1,299	108%
Block 4: 9,001 to 12,000 IG/month	796	1,657	108%
Block 5: 12,001 to 20,000 IG/month	992	2,064	108%
Block 6: above 20,000 IG/month	1277	2,657	108%
Commercial	1229	2,558	108%
Condominium	610	1,269	108%
School	492	1,023	108%
Average*	817	1,700	108%
***Average is estimated by dividing total billed in wastewater charges (including PAM, K-factor, and X-factor), by total imperial gallons of wastewater discharged billed.**			

Table 3.2: Proposed Tariff for other wastewater systems, by Customer Band

Band	Tariff Effective 1st April 2013	New Tariff Proposed	Increase
Residential			
Block 1: 0 to 3,000 IG/month	328	452	38%
Block 2: 3,001-6,000 IG/month	578	796	38%
Block 3: 6,001 to 9,000 IG/month	624	860	38%
Block 4: 9,001 to 12,000 IG/month	796	1,097	38%
Block 5: 12,001 to 20,000 IG/month	992	1,367	38%
Block 6: above 20,000 IG/month	1277	1,759	38%
Commercial	1229	1,694	38%
Condominium	610	840	38%
School	492	678	38%
Average*	817	1,126	38%
***Average is estimated by dividing total billed in wastewater charges (including PAM, K-factor, and X-factor), by total imperial gallons of wastewater discharge billed.**			

The NWC requested that the KSA tariff be revised when the tariff for CWTC, the operators of the Soapberry wastewater treatment plant, is approved by the OUR, in a way that the Soapberry tariff can be treated as a pass-through cost for the KSA system.

3.6 PRICE ADJUSTMENTS

3.6.1 Price Adjustment Mechanism (PAM)

The Commission requested that the tariff be indexed to input price increases through PAM. However it argues that the current PAM is not efficient in recovering the Commission's costs and suggested that the structure be changed. In this regard, it has suggested that the weights associated with each factor in the PAM be adjusted to reflect the impact that costs that vary with the specific cost factors have on total expenses. It also recommended that the components which constitute the PAM be expanded to include a wage index and an asset revaluation index to better capture changes in these cost components.

The formula proposed for the PAM is outlined below:

$$PAM = \left[w_{fe} * \Delta FE + w_{cpi} * \Delta CPI + w_{ec} * \Delta kwh + w_{wi} * \Delta WI + w_{ar} * \Delta AR\right] * 100$$

Where,

ΔFE is the percentage change in the J$/US$ exchange rate;

ΔCPI is the percentage change in the Consumer Price Index;

Δkwh is the percentage change in the kilowatt hour charge for

electricity;

ΔWI is the percentage change in the Jamaican Wage Index;

ΔAR is the percentage change in the Asset Revaluation Index; and

w_{fe} is the weight associated with J$/US$ exchange rate;
w_{ec} is the weight associated with the kilowatt hour charge for electricity
w_{cpi} Is the weight associated with the Consumer Price Index; and
w_{wi} is the weight associated with the Jamaican Wage Index; and
w_{ar} is the weight associated with the Asset Revaluation Index.

3.6.2 The Commission further outlined that the wage index proposed will be calculated using the STATIN series, 'Average Wage and Wage Earners in Large Establishment", by Major Industry Groups in JMD ($).

3.6.3 The Asset Revaluation Index is the same index used for the 2013 asset revaluation and is made up of:
31.9 percentage of the Pipes Index; this index is calculated with the following formula: 0.75*(US PPI Ductile Iron Pipes Index* change in rate of exchange between the J$ and the US $*0.70+ CPI Jamaica * 0.3) +0.25 * US PPI Plastic Pipes * change in rate of exchange between the J$ and the US$ 0.75+ CPI Jamaica * 0.25)

2.6 percentage of the Pump Index, using the US PPI Pump Index * change in the rate of exchange between the J$ and the US $.

2.0 percent of the Equipment Index, Using the US PPI Capital Equipment Index * change in rate of exchange between the J$ and the US $63.5 percent in Annex 1 of Jamaica CPI.

3.6.4 The Commission proposed the changes to the Weights, set out in Table 3.3 below. It asserted that the weights are derived from the portion of the NWC's total cost of service that is affected by the five variables listed in the said Table.

Table 3.3: Proposed changes in PAM weights

Index	Existing	Proposed
Exchange rate	0.28	0.05
Electricity	0.25	0.13
CPI	0.47	0.31
Jamaica Wage Index	N/A	0.15
Asset Revaluation Index	N/A	0.36
Total	100	100

3.6.5 The Commission proposed that the PAM indices should be applied on a monthly basis and that the PAM should be reset at its anniversary. Also at this time, the new base values of the indices should also be reset.

3.7. K-Factor

NWC proposed that the K-Factor variable remains at 27% for the first three (3) years of the new tariff period and then be reduced to 26% for the remaining two (2) years as seen in Table 3.4 below. This proposed schedule for the K-Factor is consistent with the schedule approved by the Office in the 2008 Tariff Determination Notice.

Table 3.4 Applicable K-factor percentage

Year Ending March	2014	2015	2016	2017	2018	2019	2020	2021	2022
K-Factor	27%	27%	27%	26%	26%	24%	24%	23%	23%

Source: NWC Tariff Submission for 2014-2018

The Commission further proposed that the pre-conditions outlined for the K-factor remain, viz:

- Deemed K-factor cash inflows should be calculated on the basis of 90% of the K-factor billing.
- A separate bank account to accommodate the cash flows from the K-factor.
- The NWC will report monthly to the OUR on balances and changes on the account within forty-five (45) days of each reporting period.
- K-Factor billed shall be deemed collected within forty-five (45) days after billing.
- The K-Factor should be calculated on the bill balance after the X-factor is deducted.

3.7.1 Assuming the revenue projections as submitted in the NWC tariff proposal, it is expected that the K-Factor at the proposed rates would yield between J$39.71 for the tariff period as seen in Table 3.5 below.

Table 3.5 K-Factor Projections as Per NWC Tariff Submission 2014-2018

	Year					
Projected Inflows	**2014**	**2015**	**2016**	**2017**	**2018**	**Total**
(Tariff Submission)	J$B	J$B	J$B	J$B	J$B	**J$B**
90% of billed**	5.967	6.958	8.092	8.880	9.811	**39.708**

***Source: NWC Tariff Submission for 2014-2018**

3.7.2. The NWC further proposed that the K-Factor funds yielded over the new tariff period be expended on the following areas as set out in Table 3.6 below.

Table 3.6 Proposed K-Factors CAPEX 2014 – 2018 (Summary)

Project Type	Total (US$M)	2014	2015	2016	2017	2018
Energy Efficiency Projects	8.14	8.14	0	0	0	0
Sewerage Projects	116.55	26.65	22.7	17.2	25	25
NRW Reduction Projects	217.87	61.03	67.19	59.72	19.93	10
GRAND TOTAL, US $million	**342.56**	**95.82**	**89.89**	**76.92**	**44.93**	**35**
GRAND TOTAL, J$ billion *	**34.94**					

* Exchange rate of J$102: US$1

The detail K-Factor projects proposed by the NWC are outlined in **Annex 1**.

3.8 X-Factor

The X-Factor is a variable that captures efficiency gains arising from the K-Factor programme. The NWC requested that the X-Factor be revisited as set out in Table 3.7 below. It is proposed that the new X-Factor schedule be in line with the efficiencies that the NWC has achieved and can realistically achieve by implementing its capital expenditure programme over the period 2013-2018. It is proposed that the X-factor be set to zero for the first three years of the tariff period and be set to 2.3% in 2017. The Commission asserted that the change to the X-Factor would mean that efficiencies will be passed on to customers at a slower rate than expected in the 2008 Tariff Determination Notice. However, after 2017 the X-Factor will grow progressively to pass on to customer the benefits of the gains the NWC will achieve. The X-Factor is to be deducted on the bill after the water charges, sewerage charge, service charge and PAM.

Table 3.7 Proposed X-Factor variable

Year ending March	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
X-factor	0.0%	0.00%	0.0%	-2.3%	-7.4%	-11.8%	-16.6%	-20.1%	-20.9%

3.9 Pass-Through of Bulk Purchase Costs

The Commission proposed that the OUR allows it a direct pass-through of all bulk purchase costs to its customers, when these costs are approved by the OUR. Specifically, the Commission is requesting that the cost for the Soapberry Treatment Plant and Untreated Water Purchases costs be included as an operating expense in the base rate for the tariff period. The NWC further requested that the OUR agrees that any change in these costs proposed be passed through to customers. It proposed that at the next tariff period the rates be set so that these costs are separate from the base tariff as pass-through costs.

3.10 Pass-through of Taxes

The Commission proposed that any new taxes that it has to pay during the regulatory period be a pass-through such as the Commission's liability to pay GCT on electricity bills or corporate tax.

3.11 PATH Programme for Water

The NWC requested that the PATH programme be expanded to support poor households that cannot pay/afford their water bills. It further requested that the OUR in its determination notice gives a directive to the Ministry of Labour and Social Security to pay the PATH water bill subsidy directly to the NWC, which will then be credited to the bills of households. The Commission added that if such a request is not granted, then the OUR should consider authorising a Universal Service Fund Levy, that is a small charge to be added to customers' bills and to be used exclusively to make water services affordable to all residents in NWC's service area.

3.12 Energy Surcharge

In NWC's view water charges on all its systems should at least cover the variable operating cost of supply. The Commission stated that electricity cost is the main cost that differs significantly between areas. In this regard, NWC contended that the volumetric bills that customers face for water service should be equal to at least the cost of electricity consumed in providing these services plus a ten percent (10%) allowance for bad debt. Consequently, NWC requested that the OUR makes the following determinations:

1. Approve in principle the application of an energy surcharge to ensure that volumetric water charges on

each major water system cover at least the electricity cost of the system plus ten percent (10%).

2. Direct the NWC to develop such a system within six (6) months of the OUR's determination and submit it for the OUR's approval.

3. Indicate that once approved, the NWC will be expected to implement the electricity surcharge scheme as approved.

3.13 Seasonal Tariffs

The NWC requested that the OUR invites it to develop a conservation charge in the upcoming regulatory period.

3.14 Security Deposit

The NWC proposed that customers pay a deposit of up to two (2) months of estimated billings where NWC considers this appropriate and desirable. The Commission indicated that a policy has been developed to deal with the application and management of the security deposit.

3.15 Charges to delinquent and inactive customers

The Commission asserted that it has developed various options to increase total revenue growth through achieving greater customer satisfaction and reducing operational cost and in this context is considering implementing:

- service charge to inactive accounts,
- a sewerage fee to inactive accounts,
- late fees to delinquent accounts,
- In addition, the Commission proposes to charge a late fee on overdue bills.

3.16 Coverage and Service Standards

The NWC proposed new coverage and service targets for the new regulatory period. These have been grouped into two sets of indicators – The proposed quality of service targets and the guaranteed standards.

3.17 OPERATIONAL PERFORMANCE

3.17.1 **Water and Sewerage Coverage**

The Commission has set itself a goal of achieving 85% coverage for water and 60% for sewerage by 2020. The NWC indicated that water and sewerage coverage are calculated by international standards. Coverage is the percentage of the population with access to the service, as a percentage of the total population under a utilities nominal responsibility. The NWC suggested the inclusion of water and sewerage coverage as key performance indicators in the regulatory framework for the next five (5) years.

3.17.2 Water and Sewerage Infrastructure

Over the years, NWC has been implementing a number of water and sewerage infrastructure programmes. The Commission through the K-Factor Programme proposed to spend some US$116.55M on sewerage

projects islandwide over the five-year tariff period.

3.17.3 Water Quality

NWC stated that the present water quality is generally good, but is compromised in some areas. It asserted that its water quality is 95% compliant. The required standard is 99% compliance by:

1. Saline intrusion
2. Nitrate contamination from fertilizer and improper sewage disposal.
3. Effluents from industries include bauxite, sugar and food processing
4. Pesticides used in catchment areas.

3.17.4 Non- Revenue Reduction Program

NWC claimed non-revenue water (NRW) as a percentage of production throughout the tariff period was reduced from 72% in 2008/09 to 68% in 2010/11. The reported figure for 2011/2012 is however 69%. This is a far cry from the Commission's target of 50%. NWC also reported that unaccounted for water is 68%, 13% higher than the target set for the period.

Annex 2 outlines NWC's proposed operational and financial targets.

3.18 FINANCIAL PERFORMANCE

Financial performance

NWC reports that during the tariff period, April 2008 to March 2013 it achieved some of the financial targets that were outlined in the 2008 Tariff Determination Notice. The Commission argued that even though it has not achieved most of OUR's targets, its performance against these targets throughout the tariff period has been improving or remains stable. Table A2 in Annex 1 outlines the proposed financial targets.

3.18.1 CAPITAL COSTS

Capital Investments/Asset Base

The NWC indicated that its capital investment consists of an asset base, plus working capital. It defined its asset base as comprising fixed assets which include property, plant and equipment plus intangible assets. The Commission proposed an asset base of J$69.20B for the year 2013/2014.

The Commission attributed the increase in its asset base to the revaluation of property and equipment. Notably, the revaluation exercise results in fixed assets increasing by approximately 82% from 2012 to 2013. The NWC further explained that the increase in its fixed asset is also due to the commissioning of new capital expenditure programmes.

For the new regulatory period (2013/2014 to 2017/2018), the Commission projects a capital investment programme amounting to J$87 billion. Notably, in one year (2013 to 2014) NWC proposes to increase spending on capital expenditure from $8 billion to $15 billion.

NWC contended that this programme is designed to effect improvement in several areas of its operations and is expected to increase coverage through increasing potable water connections, provide additional sewer connections to an estimated 145,000 households, improve energy efficiency and reduce NRW. To this end the Commission reported that it has established a K-factor Unit and an IDB Unit to assist with the implementation of its capital expenditure programme.

Among the major projects NWC claimed are well under way are: the Kingston Metropolitan Area Water Supply improvement project which it claimed will increase reliability of supply and improve water quality assurance for two water treatment plants (Hope and Mona) totalling 20 migd; the KSA sewer expansion project that will result in the construction of new sanitation infrastructure to improve public health and environmental conditions as well as to increase sewage coverage; and the CReW project that will rehabilitate several wastewater treatment plants over time.

3.18.2 Loans and loan interest

The Commission reported that it had secured some US$200M in loans some of which will be serviced from K-factor proceeds. The interest rates reported on existing long term loans are 5.8% in 2013 and 5.1% in 2014.

3.18.3 COST OF EQUITY

The cost of equity proposed by the NWC was calculated using the Capital Asset Pricing Model. The real cost of equity denominated in US dollar is 16.0% while the nominal cost of equity is 18.2%. As regard its preferred option (Option B), the NWC is proposed to earn a zero return on equity in the year 2014 and after 2014, to earn a return on equity equal to the efficiency gains for each year.

3.19 BREAKOUT OF OPERATING COSTS

Table 3.8 below shows the breakout of operating costs proposed by NWC for the period 2013/2014.

Table 3.8 NWC estimated operating cost

Category/Year	2013/2014 $'000
Salaries, wages and related cost	5,532,753
Repairs and Maintenance	3,109,668
Administration	4,876,714
Telephone	146,327
Fuel & lubricants	321,811
Electricity	6,040,216
Purchases – water	285,787
Loan interest	1,392,897
Depreciation	8,697,658
Soapberry cost	1,299,996
Total	**31,703,826**

3.20 CUSTOMER OPERATION

NWC reported that its average active customers for the year 2013/2014 stand at 376,337 for potable water and 141,851 for sewage. The Commission is projecting that customer base for residential customers will increase by 6.2%; residential customers with sewerage connections will increase by 20.4% and that commercial customer (Water and Sewerage customers) will increase by 1.9% annually over the pricing period. All other customer classes remain unchanged. Table 3.9 below outlines the constituents of NWC's customer base.

Table 3.9 The NWC's Customer Base

Customer Classification	# of Water Customers	# of Sewage Customers
Residential	350,824	111,795
Commercial	22,038	6,117
Condominium	204	92
Schools	790	115
Government	2,892	408
Total	**376,748**	**141,851**

3.21 MACRO-ECONOMIC REVIEW AND OUTLOOK

NWC claimed that, consistent with its view on the importance of the provision of water to economic progress, it has developed and estimated a number of macro-economic factors that will have an effect on the determination of an efficient tariff. These factors and assumptions about them were employed throughout the proposed tariff model, notably, population growth of 0.40% in 2014, GDP per capita constant prices of 0.27, inflation at 6.0%. NWC explained that it considers interest rate to be important as it will be critical to the financing of its capital projects. At the same time, NWC has indicated that the majority of its equipment costs are quoted in US dollar and so the exchange rate is critical while growth in GDP and the inflation rate will determine the price, cost and sales growth in revenues.

3.22 MAKING NWC EASIER TO REGULATE

NWC complained that the service performance indicators for the previous pricing period were so numerous that it found it difficult to monitor all of them successfully. Most of the performance indicators adopted were however proposed by the NWC and accepted by the OUR. As a consequence, it asserted that the monitoring of some key targets was left behind. In this regard, the Commission proposed that for the new pricing period the number of service target be limited to a smaller, but more reasonable number which it will monitor over the next five years. NWC asserted that in order to meet these high level targets it has already started to develop a balance score card for the next four years. The Balance Scorecard will break down the strategic goal into more detailed operational goals and targets that need to be met in order to achieve NWC's larger scale strategic service improvement goal. The Commission indicated that all regulatory standards will be key performance indicators in relevant managers' performance appraisals.

3.23 EFFICIENCY IMPROVEMENT PLANS

3.23.1 NRW Reduction Program

The Commission stated that it is in the process of implementing a NRW reduction strategy, with the following three focuses:

- Reduce commercial losses from large customers island wide
- IDB supported NRW reduction programme in KSA
- Island wide NRW reduction roll- out.

At the same time, NWC claims that its NRW strategy is already showing results in specific areas where the NWC has focused its efforts, albeit their effects are not reflected in the total NRW figures because they have been countervailed by declines in other areas.

3.23.2 Energy Efficiency

The NWC asserted that energy costs accounts for about 31% of its overall operating costs. Reduction in energy cost is therefore vital to overall cost reduction. It has therefore established a dedicated NRW and Energy Cost Reduction Unit. According to NWC, the energy costs reduction will be achieved by rehabilitating water storage tanks, rehabilitating or constructing new transmission and distribution mains that lead from storage tanks and pump replacement.

3.23.3 Collection Improvement

The NWC is projecting to improve its collection rate to 90% in 2018 and 95% by 2023. The Commission stated that so far its collections efforts have been piece-meal and ad-hoc. It has however, developed a Receivables Management Plan (RMP) to be implemented in financial year 2013/2014. The NWC collection improvement efforts will be centred on:

- diagnosing delinquency rate
- organisational changes and resources
- partnering with other organization(s)
- better service and accurate billing

3.23.4 Labour Productivity Strategy

The Commission proposed that it will achieve improvement in its staff efficiency ratio by implementing a number of learning and growth initiatives in its Strategic Transformation Plan.

CHAPTER 4: PUBLIC CONSULTATION

4.1 Introduction

In keeping with its practice and mandate the OUR convened public consultation meetings to hear the consumers views on the NWC's tariff submission. These meetings were strategically held across all three counties of the island in an attempt to ensure that wide cross sections of consumers were given an opportunity to participate in the process. The primary objectives of these meetings were:

1. To facilitate a platform from which the NWC could engage its customers with respect to:
   a) The content and reasons for its submission to the OUR; and
   b) The company's plans for the future with regard to service delivery.

2. To hear the views of consumers regarding NWC's submission.
3. To obtain information from consumers with regard to general service delivery by NWC in their respective areas;
4. To provide the public with an opportunity to advise the OUR of matters it considers relevant to the determination of NWC's application.
5. To obtain feedback specific to the established quality of service standards.

5.2 In addition to the public consultations that were held, many consumers provided the OUR with their views on the NWC tariff submission and service quality issues through letters and telephone contacts.

4.2. Summary of NWC's presentation

In its presentation, the NWC highlighted reasons for its request of a tariff increase. These included plans to replace its aging infrastructure in an effort to improve water supply in various parishes. The NWC also informed consumers of projects earmarked for specific parishes including the well needed rehabilitation of sewerage ponds.

In addition to water and sewerage improvement projects, the NWC expressed concern regarding the high rate of delinquency by customers with respect to payment of bills. The NWC also observed that there was a practice by farmers to misuse treated water by using it for irrigation purposes. Accordingly, the NWC encouraged farmers to engage the National Irrigation Commission with regard to the provision of water for irrigation purposes as it was uneconomic to use treated water for farming.

4.3. General Views on the Proposed Tariff

With the exception of the consultation held in Kingston, all other meetings were well attended by consumers and other stakeholders. At the meetings, consumers voiced their dissatisfaction with the request by the NWC for a tariff increase.

The general position of consumers was that it was only reasonable that the NWC justified its request for a further increase through performance. They noted that at the previous tariff review, the NWC had committed to significant improvement in its operations. As such, it was their expectation that the NWC would inform consumers of the improvements since the previous tariff increase, and not just about the future plans to improve its operations.

Accordingly, there was a collective view that the NWC in its request for a tariff increase had failed to demonstrate to the public, how the Commission had effectively utilised the tariff increase it received in 2008.

Consumers expressed the view that the NWC should channel its resources into the development and implementation of strategies to reduce its losses prior to a request for further increase in tariff. In their estimation, if the NWC implemented a comprehensive strategy for loss reduction within a few years after such implementation, the Commission would have a better handle on its revenues. It is only then, they believe that the Commission should request a rate increase, if still deemed necessary.
The main issues communicated by consumers at the meetings are summarised below:

4.4. Metering

Consumers were concerned that the NWC had not done enough to ensure that most residential customers were metered. According to them, there are many locations across the island that remains unmetered. They further stated that some of the unmetered areas are categorised by the NWC as red zones. However, in their opinion, some of the areas so categorised by the Commission are not volatile and as such, more effort should be made by the NWC to meter these premises.

The delay in meter replacement was also highlighted by consumers. They reported that it took the NWC too long to replace faulty meters after these are detected. As a result of this delay, customers report that they receive estimated bills for extended periods, which are usually not reflective of their usage pattern.

4.5 Irregular Supply

The unavailability of a continuous supply of piped water to many areas across the island was a common concern throughout the consultations. Parishes such as Manchester, Trelawny St. Thomas and St. Elizabeth, appeared to be most affected. Consumers also expressed disaffection that even while this persists they are consistently presented with NWC bills.

4.5.1 Manchester

Similar to the 2008 consultation, residents of Manchester complained that despite the extended drought experienced in areas such as Mandeville, the NWC has still not addressed the water needs of the parish. In their opinion, it was therefore unreasonable of the NWC to request a rate increase.

4.5.2 Trelawny

Residents of the parish of Trelawny expressed 'no confidence' in the NWC's ability to deliver on its promises. Their lack of trust in the entity came against the background of reported past commitments given by the NWC to improve the water supply to some districts which to date, have not materialised. They informed that sections of Sherwood Content were still without water and although pipelines were laid in other districts, these communities are still without water.

4.5.3 St. Thomas

In the case of St. Thomas, residents complained that although the Commission's pipeline passes in close proximity to some communities, the water is diverted to serve areas of KSA. They complained that no provision has been made by the NWC for water improvement to many districts while areas such as Botany Bay and White Horses appear to be forgotten by the NWC.

4.5.4 St. Elizabeth

Consumers at the St Elizabeth meeting in particular complained that water was unavailable during different periods for different districts within the parish. They reported that the duration of the unavailability of water may be months for some districts and was an on-going issue for years in others.

In response to the residents of St. Elizabeth, the NWC informed that the valves supplies in the parish are turned on at different times for different communities. The Commission however advised that a schedule would be developed to ensure that communities are more regularly served.

4.6. Pump Failure

The frequency of pump failures was a major area of disaffection to consumers. They lamented that far too often communities are left without water as a result of breakdowns. While acknowledging that at times these failures were due to electricity outages, consumers were of the view that in most instances failures were as a result of lack of appropriate pump maintenance by the NWC.

4.7. Delay in Repair to Broken Mains

The delay in the repair of broken mains was a major concern to consumers. Customers throughout the parishes complained that despite several calls to the NWC regarding leaks, there was no timely response to address them. It was their opinion that the slow response by the NWC to effect repairs to mains was a contributing factor to the current level of NRW and a reflection of its inefficiency. Parishes such as St. Thomas, Clarendon, St. Elizabeth and Clarendon appeared to be most impacted by leaks.

4.8. Water Trucking

Customers affected by the lack of a continuous supply of piped water, shared the view that water trucking to parishes by the NWC lacked structure and transparency. According to customers, plans by the NWC to truck water to any area should take into account factors such as the number of NWC customers in the affected area and the duration of water lock-offs.

In support of the view for an appropriate structure for water trucking, a customer reported that during a period of water lock off (which reportedly lasted a total of four weeks), the affected community received trucked water on only one occasion, which occurred in the second week. The customer further reported that the trucked water was only received after repeated calls to the NWC regarding the lack of water in the community.

In another reported case, the customer expressed the concern that after several days without water, the quantity of water trucked by NWC was insufficient to supply all customers in the community. As a result, customers reportedly had to purchase water from private water suppliers which proved very expensive.
Other reports received by the OUR from customers, state that on many occasions they did not receive trucked water as the trucks are too big to traverse through their communities.

Customers have also reported to the OUR that in times of drought or when the community does not receive a consistent supply of water, which is known to the NWC, they are denied trucked water if their water bills indicating estimated consumption is not paid in full.

4.9. Customer Service Issues

An unacceptable level of customer service at the NWC offices island-wide was another major concern communicated by consumers. This matter was also a major issue at the 2008 public consultations. It was customers' views that the NWC representatives were complacent and unprofessional in their delivery of customer service.

Many customers reported an inability to contact NWC representatives by telephone due to unanswered calls or inordinately long 'hold times' resulting in calls eventually being abandoned. They also reported that whenever a request was made at the parish offices to speak with a supervisor or a manager, in most instances this request was not granted.

As it relates to the general provision of information on individual accounts, customers reported that the information received at the call centre is usually insufficient and oftentimes not current. This, they stated was especially the case with information on bill balances.

4.10. Health Concerns

Concerns on matters that consumers perceived to be a risk to health, were communicated at the consultations. These concerns were primarily associated with the NWC's treatment of sewage and the quality of water supplied to some communities. These two (2) issues are outlined as follows:

4.10.1. Lack of Maintenance of Sewerage Infrastructure

Residents of Portmore, St. Catherine were particularly vocal with regard to the state of sewerage ponds in the area. They complained that the lack of maintenance and rehabilitation works to some ponds created a risk to their health due to mosquito infestation and the proximity of the ponds to schools and homes.

In addition to the foregoing concerns, residents of St. Thomas complained about frequent sewage overflows on streets in some sections of the parish which they attributed to lack of maintenance of the sewerage plants in the parish. In their opinion, sewerages rates to residents of St. Thomas should be discontinued until these overflows are permanently rectified.

4.10.2. Water Quality Issue

While there is consensus that the quality of water produced by the NWC is good overall, the matter of high levels manganese deposits in water supplied to sections of Greater Portmore, St. Catherine, was again an issue communicated at the public meeting convened in the parish.

The residents were informed by the NWC that manganese chloride is a characteristic of the well from which the community is supplied. The Commission further advised that a filter will be installed.

4.11. Damage to Road Network

The continuous complaint by customers regarding the damage to road network due to pipe laying activities by the NWC was a recurring issue at the consultations. Although the NWC informed the public that it now had an arrangement with the National Works Agency (NWA) with regard to road repairs, consumers were of the opinion that these repairs were not being effected in a timely manner.

CHAPTER 5: OFFICE EVALUATION OF APPLICATION

5.1 Introduction

In making this determination the Office has given due consideration to several issues:

- efficient cost recovery,
- adequate service delivery,
- sustained financial viability,
- Rate structure that is reflective of both water and sewerage services and reflects the cost of usage whilst not unfairly burdening consumers at the lower end of the consumption spectrum.
- future changes to the Commission's organization structure
- The need to ensure that the rate regime provides incentive to drive efficiency over the pricing period.

  In the assessment of the NWC's tariff, the operations of the Commission were divided into two categories water and sewage.

Tariff Methodology

The NWC proposed a methodology that is predicated on a five (5) year projection of operating targets and costs. This approach would require the OUR to depart sharply from the known and measurable principles required in performing rate reviews. Additionally, it would also require the Office to place great confidence in the NWC's ability to achieve its objective. The NWC does not have a good track record in terms of its ability to achieve targets and it also has a record of poor financial performance. In the circumstances, the OUR decided that it will not apply the approach proposed by NWC, and set out in the tariff Option B. The Office has however decided to use tariff option B as a guide which involves the NWC achieving full cost recovery in each year.

In accordance with the OUR's full cost recovery approach, the basic mechanism used for calculating the rates to be paid by customers to NWC involves the following:

1. Establishment of a test year which shall be the latest twelve (12) months for which there are audited accounts.

2. Adjustment of the results of the test year to reflect normally expected operating conditions, revenues and costs that would come into effect before the implementation of the rates.

3. Determination of a Rate Base to reflect net investments with adjustments as appropriate.

4. Determination of the Revenue Requirement as the sum of:

   a. Operating costs;
   b. Depreciation;
   c. Taxes;
   d. Return on investment allowed.

5. Determination of an X- Factor and K- Factor; and
6. Determination of Price Indexation Parameters.

5.2 Performance against Target

At the 2008 rate review, the Office included in the 2008 Tariff Determination Notice, several performance benchmarks that the NWC should achieve under the 5-year tariff period (see Table 5.1 below). The targets were based on the proposal submitted by the NWC. The targets addressed the operational, financial and customer service aspects of the NWC's operations. The regulatory framework which was developed and issued shortly after the determination included further details of the various targets as well as the reporting requirements to be met by the NWC[1]. The Office regarded the achievements of these targets as critical to the financial and operational sustainability of the NWC and factored the achievement of these targets in the development and calculation of the Commission's operation cost. Table 5.1 below highlights the main targets that were set and the status of the NWC in meeting these targets.

Table 5.1: NWC's Performance against Targets

Performance Measure	Target – per 2008 Tariff Review	NWC Performance 2011/2012	Status
Days of Sales Outstanding	Forty-five (45) days	Fifty-four (54) days	Not Achieved
Employee Costs	35% of operating revenue	22% of operating revenue	Achieved and exceeded
Employee Efficiency	4.5 employee per 1000 accounts	5.8 employee per 1000 connections	Not achieved
Billing and collection	Collection rate 95% of billed revenues	85% of billed revenues	Not achieved
Non-Revenue Water (NRW)	NRW as a percentage of production 50%	NRW as a percentage of production 69%	Not achieved
Percentage of Un-accounted for water (UFW)	Percentage of UFW 55%	Percentage of UFW 68%	Not achieved
Improve billing and collection	Percentage of actual customers billed 100%	Did not comment on this after 2008.	-Unknown
Asset Valuation	The NWC shall continue to reflect a fair market value of assets used in the provision of utility services and update their values on an annual basis	The NWC has re-valued their assets based on figures in the 2012/2013 audited statement	Achieved
Functioning Meters	Must have at least 90% of accounts with functioning meters by March 2011	82% in the year 2011/2012	Not Achieved

[1] *National Water Commission Regulatory Framework (2008-2013), Document No. Wat2008/06:Det/03*

5.2.1 Based on the data presented by the Commission, the NWC's financial indicators of reducing staff costs to 22% was achieved, but the NWC did not achieving its employee efficiency ratio of 4.5 employees per 1000 connection.

5.2.2 The NWC admitted that it continues to have difficulties collecting its revenue, which resulted in its collection rate decreasing from 89% in 2009 to 85% in 2012.

5.2.3 The NWC reports also indicate that instead of a reduction in water loss UFW levels increased to 68% in December of 2012. The Office is of the view that the high levels of losses experienced by the NWC coupled with its low collection rate are significant contributor to NWC's poor financial status.

5.2.4 With regards to reporting, the Office is dissatisfied with the level of reporting during the five year period. The NWC did not meet the forty-five (45) days deadline in most instances and even with the delay in submission, there were also questions raised at times as to the accuracy of the reports submitted. The Office is also dissatisfied with the results received from the implementation of the new Customer Information System adopted by the NWC and its inability to provide adequate consumer/customer data. The Office is of the opinion that this system has been in place for sufficient time to generate data on number of customers according to categories and the status of their accounts (active, inactive temp. disconnected). This kind of data is needed both for the Commission to make informed business and management decisions throughout the tariff period and for effective monitoring by the OUR. The Office will outline NWC's reporting requirements in their Regulatory Framework[2].

In the 2008 Tariff Determination Notice the Office determined that at the next review it would proceed on the assumption that the NWC achieved the specified targets. In attempting to explain its failure to meet the targets, the NWC has argued inter alia, that the OUR's failure to grant the full tariff it requested in the last review, capacity issues that delayed capital expansion, and an overly optimistic view of the immediate gains from the K factors were some of the factors militating against its effort to comply with targets.

5.2.5 The Office does not consider the arguments proffered by NWC to be entirely convincing. At the last three tariff reviews, the Commission requested and received real increases in its tariffs which when combined with the PAM should have put the NWC on a path to financial sustainability. Instead the NWC's performance suggests that the level of inefficiency has not improved. Consequently in making this determination on the new rates, the Office, while taking account of the actual performance and the reality facing the Commission over the period is constrained to assume certain levels of efficiency that would obtain had the NWC achieved the benchmarks.

5.2.6 The Office has also given due consideration to the issues raised at the public hearings and those received from customers through other communication avenues.

5.3 TOTAL OPERATING COSTS

5.3.1 Introduction

The Office holds the position that the deemed operating costs should be that of the test year[3] adjusted for costs that are known and measurable within a twelve (12) month period and reflect the reasonable cost of

[2] See footnote 2

[3] The test year used in this document is that of the financial year 2012/2013

providing acceptable quality of service to customers. An examination of the movement of expenses over the 5-year tariff period shows a steady increase in the level of these expenditures. This is highlighted in Table 5.2.

Table 5.2: Movement in operating cost component ($'000)

Category	2008	2009	2010	2011	2012	2013
Salaries, wages and related cost	$5,011,481	$5,962,712	$6,107,704	$6,034,323	$6,196,301	$5,992,633
Repairs and Maintenance	$1,452,217	$1,883,943	$1,979,174	$1,856,601	$2,605,541	$2,252,627
Administration	$1,626,927	$1,896,740	$2,377,398	$2,998,866	$3,306,182	$3,490,365
Electricity	$3,134,095	$4,078,930	$4,220,757	$4,356,633	$5,839,767	$5,965,447
Telephone	$73,014	$76,692	$110,781	$102,978	$116,526	$110,938
Fuel and Lubricant	$152,310	$154,987	$152,646	$206,767	$256,271	$265,253
Purchases – water	$73,958	$90,784	$135,476	$153,923	$246,298	$291,767
Soapberry cost	840000	840000	840000	840000	840000	$840,000
TOTAL	**$11,524,002**	**$14,144,788**	**$15,083,936**	**$15,710,091**	**$18,566,886**	**$19,209,030**
Percentage Change		22.74%	6.64%	4.15%	18.18%	3%

5.3.2 For the current tariff period, the Commission indicated that its main operating expenses are staff costs, repair and maintenance costs, administration costs, electricity, fuel and lubricant, and water purchases. The Commission further stated that in order to forecast its operating expense it analysed each component separately. According to NWC it first analyse the level of each costs and then analyse the drivers of each costs. Thereafter, the Commission includes operating efficiencies that it thinks it can achieve during the regulatory period.

5.4 Office Evaluation of Operating Costs

5.4.1 Staff Costs

Over a 4-year period, the NWC employee efficiency ratio has been improving but has not reach the efficiency target set. The Office had determined in the 2008 Tariff Determination Notice that staff efficiency ratio should be below 4.5 employee per 1000 water connections. That is, total water and sewerage employee per 1000 water accounts should be below 4.5%.

The NWC explained in its application that staff costs are made up of two components: cash pension costs and salary costs. Salary costs are forecasted by analysing the number of staff that the Commission should have and their average remuneration. The Commission also assumes that average remunerations will grow 2% in real terms each year. The Commission in its application further notes that in calculating total staff costs it is assumed that the NWC is currently achieving a staff efficiency of 5.6 per 1000 connections and will reach 4.5 staff per 1000 connections by 2018.

5.4.2 The Office concurs with the NWC and accepts that the efficiency target of 4.5 employees per 1000 water connections is reasonable. That target however, should have been achieved in the last tariff period and it would not inure to the encouragement of efficiency were the Office to allow the NWC a further five (5)

years period within which to achieve this target. The Office is once again encouraging the NWC to achieve this target by the end of the fiscal year 2015.

In calculating total staff costs the test year total salary and wages costs as outlined in the Statement of Comprehensive Income was adjusted by the point to point inflation rate (calculated by STATIN) for the months April – July 2013 of 1.6%.

Total Salaries Wages and related costs determined by the Office is therefore $6.09B.

5.5 Repairs and Maintenance

The NWC has submitted that proper maintenance is crucial to the operational performance of a utility company. It is argued that if a company fails to spend enough on maintenance, assets deteriorate rapidly reducing service levels and pushing up total cost. This, the NWC states, will result in a higher capital cost in the future. The NWC proposes that its maintenance costs should be 2.5% of the gross book value of its fixed assets less work in process (WIP). NWC's estimated gross book value of assets less WIP is $J124.3B. This amounts to total Repairs and Maintenance Costs of $3.1B.

5.5.1 While the Office accepts that proper maintenance of the assets are necessary, the extent to repair and maintenance should reduce for the assets that are extensively rehabilitated. The Office had made provisions in the K-factor for mains replacement and other sewerage rehabilitation works and therefore would not expect this category to show such a marked increase in the period to be covered by this tariff regime. The Office will allow $2.3B for this expense on the basis of inflationary movement in prices.

Total determined repair and maintenance cost is therefore $2.3B.

5.6 Administration costs

The Commission outlined that administration cost is divided into two categories bad debt and other administrative costs. The Commission stated that administration cost is derived on the assumption that the current real cost per connection of J$3.5 thousand connection per year, remains constant. This cost is then adjusted each year by an inflation index of 1.14 in 2014.

5.6.1 To forecast bad debt the Commission assumed that net account receivables will remain constant at 50 days of revenue and assumed that NWC's collection rate will increase to 90% by 2018. Total administrative cost is therefore proposed to be $4.9B.

5.6.2 The Office has also decided to separate administrative costs into two categories, bad debt and other administrative costs. Other administrative cost incurred was derived by increasing the test year balance sheet figure of $1.31B by actual inflation rates.

The amount allowed for bad debt was also revised. In the 2008 Tariff Determination Notice, the Office had initially created a provision for bad debt of 5% of billed revenue. The Commission later asked the Office to revise this figure and provided empirical evidence of its then collection rates. Consequently, the provision for bad debt was revised to 10% in fiscal year 2010/ 2011.

5.6.3 The Commission in its tariff proposal provided for bad debt allowance of $3.5B or 11.2% of revenues. This indicates an anticipated worsening of collection when the NWC should be doing everything to improve its collection. At the same time, the Commission has indicated that it has appointed a Vice President with responsibility for losses which should mean that the revenue collection efforts of the Commission will increase over the tariff period. The Office has therefore reverted to a bad debt percentage of 8% of revenues

and encourages the Commission to implement its revenue collection plans effectively and efficiently. Total bad debt allowed is $1.80M.

Total Administrative cost calculated is therefore $3.1B

5.7 Electricity costs

In the NWC's operation, the cost of electricity used in the production of potable water and treatment of wastewater represents the second largest component of the Company's total annual operating costs after Salaries & Wages and related costs. Over the period 2008 – 2012 it represented, on average, 29% of total operating expenses based on information submitted by NWC.

5.7.1 Based on the Jamaican landscape, topography and the dispersion of water demand throughout the country, significant quantities of electrical energy is required by the NWC for:

1. The production of potable water to satisfy aggregate system demand; and
2. Providing wastewater services.

This huge requirement for electricity has a significant impact on the Commission's cost of operation.

5.7.2 Notably, a significant portion of the water demand exists in elevated areas with dense population centres. In many cases, water is required to be pumped up to these elevated population centres with the company incurring very high electricity cost as a result of the pumping operation. Additionally, there is a high percentage of NRW due to major leaks affecting an aged and dilapidated water infrastructure and water theft, among other things.

5.7.3 The NWC in its tariff application has acknowledged the ramifications of the present energy and cost situation and posited that it will be undertaking practical measures to address the energy issue so as to induce significant efficiency improvements in its operation. Some of the strategies the NWC indicated it will be pursuing include:

- Reinforcement and expansion of its pump and tank programme
- Pump replacement
- Power factor correction for pump motor drives

Information extracted from NWC's submission providing historic and projected electricity costs, as it relates to water and wastewater operations is as shown in Table 5.3 below.

Table 5.3: NWC's Historic and Projected Electricity Costs

	NWC Electricity Expenses – Water and Wastewater (Historic and Planned) in J$M										
	Historic					Projected					
Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Electricity Expenses – Water & sewage	2,901	3,783	3,897	4,022	5,381	5,763	6,040	5,817	5,623	5,426	5,215

Based on the information in Table 5.3, it is clear that electricity expenses relating to both water and wastewater services have increased from 2008 to 2012, with a marked increase in 2012. Increasing electricity expenses is due to a number of factors. These include exchange rate, depreciation, rising inflation rate and escalation in fuel prices. Additionally, the increasing expense is also related to an increase in the volume of water being pumped and reduction in pumping efficiencies. These factors, among others, need to be considered when projecting future electricity costs for both the water and wastewater systems.

5.7.4 In its submission, the NWC highlighted several initiatives it has planned to undertake in order to reduce the electricity costs. These initiatives include: reducing NRW, pump replacement, using elevated tanks to reduce the need to pump directly to customers, and power factor correction for pump motor drives. NWC also proposed an energy surcharge to recover costs from customers in elevated communities where water charges are lower than electricity costs incurred in supplying that water.

Additionally, Table 5.4 below, compiled using data provided by NWC, shows projected electricity costs and gives a short breakdown as to how these costs were derived.

Table 5.4: NWC's Projected Electricity Costs (without taxation)

		2013	2014	2015	2016	2017	2018
		Water					
Water produced	IG (Millions)	62,644	64,165	65,950	67,860	69,943	72,117
Consumption per IG of water produced	kWh/1,000IG	3.0	3.0	2.8	2.6	2.3	2.1
Total electricity consumption	MWh	188,333	92,906	183,402	173,413	162,966	151,769
Average cost per kWh	J$/kWh	30.598	31.312	31.717	32.425	33.295	34.361
Total electricity	J$M	5,763	6,040	5,817	5,623	5,426	5,215
		Wastewater					
WW treated	IG (Millions)	5,580	6,698	8,148	9,843	11,788	14,020
Consumption per IG of WW treated	kWh/1,000IG	1.6	1.6	1.6	1.6	1.6	1.6
Total electricity consumption	MWh	8,937	10,728	13,051	15,765	18,881	22,456
Average cost per kWh	J$/kWh	30.6	31.3	31.7	32.4	33.3	34.4
Total electricity	J$M	273	336	414	511	629	772

It is noted from the above Table that electricity consumption per unit volume of water produced is projected to be reduce over time reflecting increased water production and system efficiency. At the same time, electricity consumption per unit volume of wastewater treated is held constant over the projected period. NWC stated, in its submission, that with respect to waste water operating expenses, it has forecast electricity "assuming no efficiencies in consumption…"

5.7.5 Electricity Cost for Water Production

The OUR in its review of NWC's submission has calculated what it deems a reasonable electricity costs for water production for inclusion in the tariff determination. These are set out in Table 5.5. Projections for water production and efficiency improvement factors were all based on water production and electricity usage data submitted by NWC. Water production is projected to increase by an average of 2.8% per year from the second year of the tariff period onwards with an average improvement of 8.5% per year in system efficiency for the same period.

The average cost per kWh used in determining the electricity cost was derived based on historic information submitted by NWC as well as factors such as:

- Efficiency improvements due to power factor correction for pump motor drives; and
- Time of use operation of pumping facilities.

Based on the above analysis, NWC's electricity costs for water production for the tariff period 2013 to 2018, is determined as follows:

Table 5.5: Determination of Electricity Costs Related to Water Production

	Units	2013/14	2014/15	2015/16	2016/17	2017/18
Water Produced	IG'000	62,643,634	64,164,879	65,949,944	67,860,113	69,943,302
Efficiency Improvement Factor			7.50%	8.11%	8.82%	9.68%
Consumption Per IG of Water Produced	kWh/1,000IG	2.92	2.70	2.49	2.27	2.05
Total Electricity Consumption	kWh	183,163,450	173,540,557	163,906,141	153,772,316	143,154,841
Average Cost Per kWh	JMD/kWh	30.71	30.71	30.71	30.71	30.71
Total Electricity Costs	JMD'000	5,625,498	5,329,950	5,034,048	4,722,808	4,396,714
Gross up for GCT on Electricity (10%)		**$6,188,048**	**$5,862,945**	**$5,537,453**	**$5,195,089**	**$4,836,385**

5.7.8 Electricity Cost for Wastewater Treatment

Electricity costs relating to wastewater treatment was determined in a similar manner as that for water production and is based on information submitted by NWC, including projections for the volumes of wastewater to be treated over the tariff period. Projections for the volumes of wastewater to be treated show an average increase of 17.7% per year from the second year of the tariff period onwards indicating major system expansion projects.

It should be noted that NWC proposed that the efficiency of the wastewater system, in terms of kWh used per gallon of wastewater treated, remain constant over the tariff period. The OUR is of the view, however, that efficiency improvements in the wastewater system should be similar to that achieved in the water system.

Based on the above analysis, NWC's electricity costs for wastewater treatment for the tariff period 2013 to 2018, is determined as set out in Table 5.6 below.

Table 5.6: Determination of Electricity Costs Related to Wastewater Treatment

	Units	2013/14	2014/15	2015/16	2016/17	2017/18
Wastewater Treated	IG'000	6,165,326	6,697,912	8,148,183	9,842,868	11,788,311
Efficiency Improvement Factor			7.50%	8.11%	8.82%	9.68%
Consumption per IG of Wastewater treated	kWh/1,000 IG	1.59	1.47	1.36	1.24	1.12
Total Electricity Consumption	kWh	9,829,736	9,877,953	11,042,452	12,162,118	13,156,351
Average Cost Per kWh	JMD/kWh	34.47	34.47	34.47	34.47	34.47
Total Electricity Costs	JMD'000	338,839	340,501	380,642	419,238	453,510
Gross up for GCT on Electricity(10%)		**372,723**	**374,551**	**418,706**	**461,162**	**372,723**

The NWC in its initial submission indicated that they have not made provision for taxes on electricity because they were seeking approval for a waiver from the Ministry of Finance and Planning, such waiver was denied by the ministry and therefore provision was made for taxes on electricity.

5.8 Other Operating costs

Telephone costs, fuel and lubricant and water purchase costs were derived by increasing the figures from the test year by actual inflation for the months of April to July 2013. Details of these costs are outlined in Table 5.7 below. The Office has determined that the total other operating costs amounts to $678.7M.

5.9 Depreciation

5.9.1 Depreciation accounts for the wear and tear of assets used in the provision of service and is recorded as an expense on the NWC's profit and loss account. The NWC has re-valued its asset and has proposed an asset base of $67.9B and depreciation of $8.7B. The Office has used the test year balance sheet to account for depreciation charges on NWC's assets. Since the Commission's revaluation exercise occurs at the end of their financial year depreciation charged on revalue assets were not included in the test year balance sheet. It is the Office's view that the depreciation charges on re-valued assets cannot be treated as known and measurable at the time of the tariff determination and therefore depreciation charges on re-valued assets were not included in total cost. Total depreciation was calculated at $3,016,686 as per audited accounts.

5.10 OUR's Regulatory Fee

The regulatory fee due to the OUR for the base year 2013/2014 is calculated as $75.49M.

5.11 CWTC/Soapberry Costs

The NWC has included $1.29B per month as the figure to be paid for the treatment of sewage at the Soapberry Treatment Plant operated by CWTC. However, CWTC applied to the OUR on February 10, 2013 for a formal tariff to be paid by the NWC. The OUR considered the application and issued its determination notice, Determination Notice: Central Wastewater Treatment Company Limited (CWTC) Rates for sewage treatment services provided to the National Water Commission: Document No. 2013/WAS/003/DET.002.

5.11.1 Based on the adjustments made to the CWTC proposed capital and operating costs and volumetric flow the OUR determined the following:

- Waste Water Volumetric Flow of 13,444,470M3
- Base Revenue Requirement of J$971 million

5.11.2 The Base Tariff structure is designed to allow for efficient and fair rates as follows:

- A Fixed tariff of J$29.4 million per month or J$392.23/ M3 per month of net available capacity ; and
- A Variable (volumetric) tariff of J$46.00/ M3

The result of the rates above is an average tariff of J$72.26/ M3. This is an overall average tariff that is derived when the actual fixed charge and volumetric rate are applied. Total Soapberry cost allowed per annum is 63.59/M^3 at an average inflow of 13,444,470M3. Total Soapberry cost is therefore $971.0M.

5.11.3 The Office is mindful of the fact that the CWTC tariff is in effect for a period of two (2) years and it is not expected that there will be any material changes in CWTC's operation that will adversely affect CWTC's total operating costs to be passed on to the NWC.

5.12 Loan Interest

NWC has made provisions for loan interest of $1.4B as part of its total operating costs. It has disclosed that loan interest was calculated by using the loan terms for all NWC's long-term loan. The Office notes however that a significant portion of NWC capital expenditure comes directly from the K-factor Fund and will be repaid from the K-factor Fund and not from normal earnings. The provision for loan interest should therefore not include K-Factor funded projects. K-factor loan proceeds are deducted since consumers have already paid for K-factor projects over the years. When this adjustment is made **total allowable loan interest amounts to $930M.**

5.12 Total operating costs determined by the Office is as outlined in Table 5.7 below.

Table 5.7 Total Operating Costs

Details	Office Determined Operating Cost '000	NWC Proposed Operating Cost '000
Total Salaries	$6,088,515.	$5,532,753
Total R&M	$2,288,669	$3,109,668
Total administration	$3,132,107	$4,876,714
Electricity	$6,560,771	$6,040,216
Telephone	$112,713	$146,327
Fuel and Lubrication	$269,497	$321,811
Regulatory fees	$75,492	$0
Water Purchase	$296,435	$285,787
Soapberry Cost	$971,497	$1,299,996
Loan Interest	$930,326	$1,392,897
Depreciation	$3,016,686	$8,697,658
TOTAL	**$23,742,709**	**$31,703,827**

5.15 Separation of Costs

The Office has decided to separate the Commission's operation costs into its respective water and sewage categories based on the average percentage of separation in the audited financial statement of the NWC. Loan interest, depreciation and return on equity were split into the two categories based on the ratio of fixed assets that are allocated to water and sewerage. Table 5.8 below outlines the respective cost split percentages.

Table 5.8 Applicable percentage split

Details	Water	sewerage
Salaries, wages and related Costs	78.00%	22.00%
Repair and Maintenance	76.18%	23.82%
Administration	76.85%	23.15%
*Electricity	92.42%	7.58%
Telephone	76.60%	23.40%
Fuel and Lubricant	79.09%	20.91%
Water Purchased	100%	0%
Soapberry costs	0.00%	100.00%
Loan Interest	77%	23%
Depreciation	77%	23%
Return on Equity	77%	23%

**Electricity was split based on the efficiency of the respective plants section5.7 explains the computation of electricity costs*

Total Operation Cost Split is as outlined in Table 5.9:

Table 5.9 NWC's Operating Costs

Details	Water '000	Sewerage '000	TOTAL '000
Total Salaries	$4,748,760	$1,339,754	$6,088,515
Total R&M	$1,743,447	$545,221	$2,288,669
Total administration	$2,407,176	$724,932	$3,132,108
Electricity	$6,188,048	$372,723	$6,560,771
Telephone	$86,342	$26,371	$112,713
Fuel & Lubrication	$213,156	$56,341	$269,497
Regulatory fees	$37,746	$37,746	$75,492
Water Purchase	$296,435	$0	$296,435
Soapberry Cost	$0	$971,497	$971,497
Loan Interest	$716,351	$213,975	$930,326
Depreciation	$2,322,848	$693,838	$3,016,686
TOTAL	**$18,760,310**	**$4,982,397**	**$23,742,709**

CHAPTER 6: Quality of Service

6.1 Introduction

There is a possibility that under a price cap regime, utility service providers may compromise the level of service delivered to its customers, in order to outperform the index. As such, it is critical that the Office, as part of its determination specify quality of service standards to ensure that the customers receive acceptable service delivery. Thus the Office developed the Overall and Guaranteed Standards to which the NWC should adhere. The Guaranteed Standards currently attract a compensatory payment equivalent to four times the service charge. The Office has reviewed the NWC's performance in regard to these standards as part of the process of this rate review.

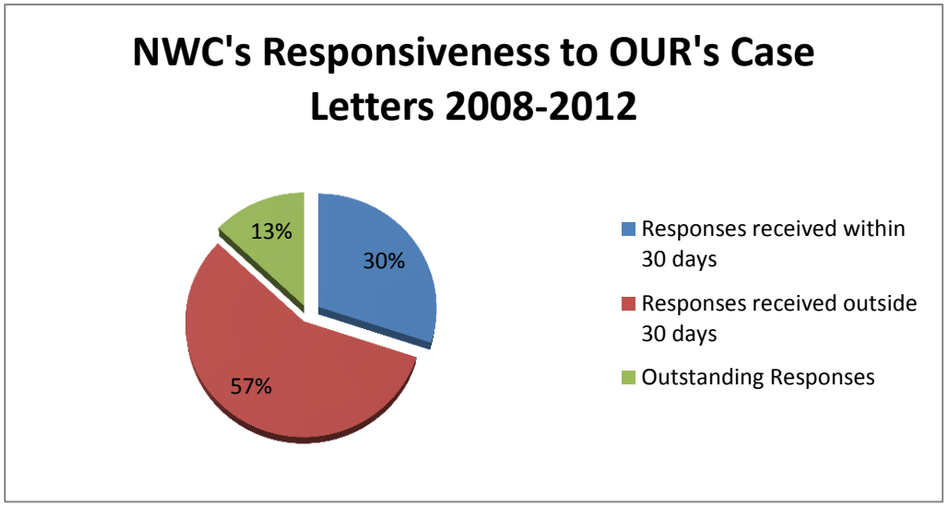
6.2 NWC's Performance

NWC's Responsiveness to OUR's Case Letters

Cases investigated by the OUR (Appeals) on behalf of consumers are handled through the Consumer Affairs Unit (CAU). The Office has noted, with concern, the delay by the NWC in submitting the relevant information to facilitate a timely review of consumer's appeal of the utility's decision.

This concern is borne out of the data within the CAU regarding NWC's responsiveness. The data revealed that of the 223 appeal cases submitted to the NWC from 2008 to 2012, only 67 responses to these cases were received from the Commission within the thirty (30) day standard for the utility to provide responses. A staggering 127 responses, representing fifty-seven percent (57%) cases were received outside of the standard. The OUR is still awaiting responses for thirteen percent (13%) of these cases.

Figure 6.1



6.3 Quality of Service Standards

Guaranteed Standards Breaches Reported by the NWC

A review of the quarterly reports on the NWC's performance under the Guaranteed Standards scheme indicate a total of 134,664 breaches were committed by the Commission for the period 2008-2012. Of the total breaches, ninety percent (90%) were due to non-compliance with **WGS 10 – 'Meter Reading'**; six percent (6%) were attributed to **WGS 4- 'Response to Complaints'** and four percent (4%) were combined breaches for the remaining standards.

6.4 Guaranteed Standards Compensation

The existing mechanism for compensation for breaches of the Guaranteed Standards involves both claim submission and automatic credits to accounts by the NWC. Accordingly, there are some parameters which when breached, require the customer to complete a claim form in order to receive compensation, while a few parameters require the NWC to compensate accounts when breached without a claim submission from the customer.

6.5 Based on the Guaranteed Standards reports for the five (5) year period, the total breaches committed by the NWC attracted potential compensation of approximately two hundred and thirty million dollars ($230M). Of this amount, less than two percent (2%) or approximately $3.5 million represented actual compensation credited to customer's accounts.

The low percentage in actual compensation for breaches is a reflection of the reluctance of many customers to submit claims. Many customers express the view that the value of the individual compensation was insignificant to the cost and hassle involved in submitting the claim to the NWC's offices. Others informed that they were denied claim forms by NWC representatives and in other cases NWC could not locate claim forms submitted by customers.

6.6 Overall Quality of Service Standards

The Office has noted the NWC's proposal to replace the Overall Quality of Service Standards with the *Quality of Service Performance Target (2014 – 2018).* The proposal was reviewed and the Office has no objection to the approach taken in developing the performance targets which will continue to measure the NWC's performance in areas that were covered under the Overall Standards. However, areas were identified for adjustments which are outlined in the Office Determination.

6.7 Changes to the Guaranteed Standards Scheme

Despite the NWC's proposal to continue with the existing standards, the Office is of the view that the Guaranteed Standards play a critical role in improving the quality and efficiency of service delivery by the main water and sewage provider. Accordingly, several parameters have been modified as outlined below:

Table 6.1 Modification to Existing Guaranteed Standards

CODE	FOCUS	DESCRIPTION	PERFORMANCE
WGS1	Access	Connection to supply	Current: Maximum time of 10 working days
WGS2	Delivery of bills	Issue of first bill	Current: Maximum time of 48 working days after connection **Modification: Maximum time of forty (40) working days after connection of supply and installation of meter.** **Office Comments: Promotes efficiency**
WGS3	Appointments	Keeping appointments	Current: Must make and keep an appointment at customers request and must notify customer within reasonable time prior to appointed time, if cannot keep appointment. **Modification/Inclusion: Appointments can be made in person or by telephone contact.**
WGS 4(a)	Complaints	Acknowledgement	Maximum of 5 working days to acknowledge customer written complaints, after receipt.
WGS (4b)	Complaints	Investigations	Maximum time of thirty (30) working days from the date of receipt of the complaint to complete investigation and respond. **Office Comments: WGS 4 separated into 2 distinct standards, each with its own compensation. Updates can also provide where the investigation is not completed within the specified 30 days period.**
WGS 5	Disconnection	Wrongful Disconnection	Current: Where NWC in error disconnects a supply associated with an account which has no overdue amount. **Language Modification: Where the NWC disconnects a supply that has no overdue amount or is currently under investigation by the OUR or the NWC and only the disputed amount is in arrears**
WGS 6	Account status	Issue of account status	Meter to be read on same day customer is moving, if on a weekday (within two (2) days of move if on a weekend) providing five (5) days' notice of move is given. Maximum time of 15 working days to

			provide final bill and maximum time of forty-five (**45) days to refund credit balances**. **Office Comments: Refund of credit balances on account is to effected within 45 days after account is closed.**
WGS 7	Water meters	Meter installation	Maximum of thirty (30) working days to install meter on customer's request
WGS 8	Water meters	Repair or replacement of faulty meters	Current: Maximum time of 30 working days to verify, repair or replace meter after being informed of defect. **Modification: Maximum time of twenty (20) working days to verify, repair or replace meter after defect is identified or reported.** **Office Comments: Promotes efficiency regarding appropriate corrective action.**
WGS 9	Water Meters	Changing Meters	NWC must provide customer with details of the date of the change, the reading on the old meter on the day and serial number of the new meter - Effective September 2008 **Modification: deletion of effective date as it is no longer relevant**
WGS 10	Water meters	Meter reading	Current: Maximum of 2 months between each meter reading and between bill issued **Language Modification: Should NOT be more than two (2) consecutive estimated bills (where company has access to meter).**
WGS10(b) (NEW)	Water Meters	Exceptional Meter Readings	Where consumption increases by at least fifty percent (50%), then the customer is to be alerted within one (1) billing period.
WGS11	Reconnection	Reconnection after payment of overdue amount	Current: Maximum of twenty-four (24) hours to restore supply.
WGS12	Reconnection	Reconnection after wrongful disconnection	Current: NWC must reconnect a supply it inadvertently disconnected within twelve (12) hours of being notified of the error.

			Modification: NWC must reconnect a supply it inadvertently disconnects within eight (8) hours of being notified of the error. **Office Comments: Promotes efficiency regarding appropriate corrective action.**
WGS13	Compensation	Payment of compensation	Current: Maximum of 30 days after claim is received to process and make payment- automatic credits should also be made within this period. Customer must make claim within 60 days **Modification: Maximum of thirty (30) working days to process and apply credit to customer's account.**
WGS 14 (NEW)	**Estimation of Consumption**	**Method of Estimation**	**An estimated bill should be based on the average of the last three (3) actual readings.**
WGS 15 (NEW)	**Billing Adjustment**	**Timeliness of adjustment to customer's account**	**Where necessary, customer must be billed for adjustment within three (3) months of: (i) identification of error, or (ii)subsequent to replacement of faulty meter**

6.9 Office Determination

Customer Service

In the 2008 Tariff Determination Notice, the Office determined that the NWC frontline customer service staff should be retrained and it required the NWC to carry out this activity within the first year 2008/2009. A report outlining its compliance with the Office's determination was received from the NWC.

Given the prevalence of reports of poor customer service by the NWC across parishes, however, it is recommended that training of frontline staff must now be an on-going activity within the Commission's offices. Accordingly, the Office has determined that the NWC must ensure that all frontline staff participate in at least one customer service oriented training each year. This training should include, among other areas: a focus on soft skills (such as communication and facilitation); information pertinent to the NWC's business in the industry; the Commission's policies and procedures; the adequacy of the responses provided to customer's complaints/queries; as well the requirements under the regulatory regime.

6.10 Water Quality Issue

Following the 2008 consultation, the NWC was required to put measures in place to effectively address the problem of manganese chloride affecting areas of St. Catherine. It was however evident from the complaints at the consultation and NWC's response, that is to install a filter, that the problem persists.

The Office is of the view that the NWC must recognise the importance of consistency in quality with regard to water it supplies to all customers. Consequently, the Office now requires that the NWC, as a part of its

quarterly submission to the OUR, submit information relating to the measures implemented to control on an on-going basis, the level of manganese chloride in the affected wells.

6.11 Utility Response Standard – OUR Appeals

The Office has noted the NWC's delay in the responding to the OUR's request for information relating to customer's appeals within the agreed thirty (30) day period. The Office is of the view that the responses can be provided within the period, and even sooner, since at the time an appeal is accepted, the NWC would have already conducted its investigation and would therefore have the requested information readily available.

In light of the foregoing, the Office is reducing the time period within which the NWC is required to provide requested information relating to appeals from thirty (30) business days to fifteen (15) business days and is establishing that ninety-eight percent (98%) of all responses must be received within this timeline.

Guaranteed Standards Effective October 3, 2013[4]

CODE	FOCUS	DESCRIPTION	PERFORMANCE
WGS1	Access	Connection to supply	Maximum time of ten (10) working days to connect supply and install meter after establishment of contract. **Compensation type: Claim**
WGS2	Delivery of bills	Issue of first bill	Maximum time of forty (40) working days after connection of supply and installation of meter. **Compensation type: Claim**
WGS3	Appointments	Keeping appointments	Must make and keep an appointment at customers request and must notify customer within reasonable time prior to appointed time, if the appointment will not be kept. **Compensation type: Claim**
WGS 4(a)	Complaints	Acknowledgement	Maximum of five (5) working days to acknowledge customer written complaints, after receipt. **Compensation type: Claim**
WGS (4b)	Complaints	Investigations	Maximum time of thirty (30) working days from the date receipt of the complaint to complete investigation and respond or provide an update. **Compensation type: Claim**
WGS 5	Disconnection	Wrongful Disconnection	Where the NWC disconnects a supply that has no overdue amount or is currently under investigation by the OUR or the NWC and only the disputed amount is in arrears. **Compensation type: Automatic**
WGS 6	Account status	Issue of account status	Meter to be read on same day customer is moving, if on a weekday (within two (2) working days of move if on a weekend) providing five (5) working days' notice of move is given. Maximum time of fifteen (15) working days to provide final bill after move and forty-five (45) days to refund excess amounts on

[4] See explanatory Notes to the Guaranteed Standards in Annex 4

			account **Compensation type: Claim**
WGS 7	Water meters	Meter installation	Maximum of thirty (30) working days to install meter on customer's request **Compensation type: Claim**
WGS 8	Water meters	Repair or replacement of faulty meters	Maximum time of twenty (20) working days to verify, repair or replace meter after defect is identified or reported. **Compensation type: Automatic**
WGS 9	Water Meters	Changing Meters	NWC must provide customer with details of the date of the change, the reading on the old meter on the day and serial number of the new meter. **Compensation type: Claim**
WGS 10	Water meters	Meter reading	Should NOT be more than two (2) consecutive estimated bills (where company has access to meter). **Compensation type: Automatic**
WGS10(b) **(NEW)**	Water Meters	Exceptional Meter Readings	Where consumption increases by at least forty percent (50%), then the customer is to be alerted within one billing period. **Compensation Type: Claim**
WGS11	Reconnection	Reconnection after payment of overdue amount	Current: Maximum of twenty-four (24) hours to restore supply. **Compensation type: Automatic**
WGS12	Reconnection	Reconnection after wrongful disconnection	NWC must reconnect a supply it inadvertently disconnected within twelve (12) hours of being notified of the error. **Compensation type: Automatic**
WGS13	Compensation	Payment of compensation	Maximum of thirty (30) working days to process and apply credit to customer's account. **Compensation Type: Automatic**
WGS 14 **(NEW)**	Estimation of Consumption	Method of Estimation	An estimated bill should be based on the average of the last three (3) actual readings. **Compensation type: Automatic**

WGS 15 **(NEW)**	Billing Adjustment	Timeliness of adjustment to customer's account	Where necessary, customer must be billed for adjustment within three (3) months: (i) identification of error, or (ii) subsequent to replacement of faulty meter **Compensation Type: Claim**

6.12 Compensation Mechanism

The Office has determined that the compensation for breach of a Guaranteed Standard will be four (4) times the applicable service charge.

Where applicable, customers must submit claims within one hundred and twenty (120) working days after the breach is committed.

6.13 Special Compensation

In the case of Reconnection after payment of Overdue Amounts, Wrongful Disconnection and Reconnection after Wrongful Disconnection, the compensation will be six (6) times the applicable service charge.

Breaches of individual standards will attract compensation of up to six (6) periods of non-compliance.

6.14 Mid-tariff Review

The Office will be conducting a mid-tariff review on the Guaranteed Standards Scheme.

6.15 Issues Requiring Policy Development

The Office is of the view that some areas of service delivery that have been identified as being deficient are more appropriately addressed through the development of policies. Under the guidance of the OUR, the NWC is required to develop and implement the policies outlined as follows:

- **Water Trucking**
  The NWC must within three (3) months of this Determination Notice, develop a policy that governs the trucking of water to its customers in areas affected by water lock offs. Specifically, the policy needs to address, among other things: an appropriate structure for the trucking of water and how trucked water is distributed to all customers who are without supply for periods exceeding twenty-four (24) hours for urban areas and forty-eight (48) hours for rural areas.

- **Disconnection/Reconnection Policy**
  A disconnection policy must be developed within the ***first month*** of this Determination Notice to be submitted to the OUR for the Office's review and approval. The policy must include, but not be limited to:
    - Temporary disconnection requests
    - Request for termination of supply
    - Disconnection/reconnection under payment arrangements
    - The disconnection of supply for outstanding amounts

- **Meter Tampering/Illegal Connection Allegations/Damaged Meters**

The NWC must within three (3) months of this Determination Notice develop procedures for evidence gathering (for example, photographs) in relation to its investigation of meter tampering and illegal connection allegations.

CHAPTER 7: CAPITAL EXPENDITURE

7.1 Introduction

In the performance of its duties, the Office has a responsibility to ensure that service providers are provided with resources to guarantee that assets used in providing service are maintained and can be replaced. The Office believes that without a proper asset management plan, the NWC will always have difficulty with planning and paying for future repairs and replacement of its assets. As one of the conditions of the new tariff regime therefore, the OUR is directing NWC to develop and provide the Office with an Asset Management Plan in 2016/2017. This plan should among other things:

- Provide information on location of asset
- Provide a listing of NWC's Major assets, useful life of assets, rate and method of depreciation
- Increase knowledge of what assets are critical to the utility operations and non-critical assets.
- Foster capital improvement projects that meet the true needs of the system

7.2 The Commission has indicated that its CAPEX program as set out in Figure 7.0 below will amount to $J87 billion over the 2013/2014 to 2017/2018 period. It also indicated that the programme is designed to improve service coverage by providing additional water connections, additional sewer connections, improve NWC's energy efficiency and reduce NRW from its current level. The Commission's capital expenditure projects are funded by multilateral institutions, private commercial banks and K-factor Fund. A list of total capital expenditure programme is outlined in the table below

The Commission further stated that it has drafted Parish Plans aimed at ensuring that at least eighty-five percent (85%) of the population has access to a reliable supply of potable water through in-house taps while it prepares a Rural Water Supply Master Plan for the remaining fifteen percent (15%) of the population, who would obtain potable water via an appropriate modality. The Commission also outlined that it plans to ensure implementation of central sewerage systems in another sixteen (16) towns, consistent with the objectives of the Water Sector Policy. The Commission stated that its objective is to achieve these investment policies within a ten (10) year period, and it has been developing the necessary institutional capacity to effectively deliver on these objectives.

It is noted for example, that NWC proposes to more than double its capital investment between 2013 and 2015. The Office takes the view that it is more prudent to approve capital expenditure levels consistent with what is known regarding the past and current performance of NWC and the Commission's current profile. The success of the Commission's capital expenditure plan will be based on the Commission's ability to deliver on its promises.

Figure 7.0

Project Name	Total Value (US$mn)	Total Investment (US$mn)									
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jamaica Water Supply Improvement Project (JWSIP) Category 'B'	70	26.60	30.30	13.00	-	-	-	-	-	-	-
Construction of 15 MGD WTP - Content St. Catherine	22.2	-	-	-	-	-	6.10	11.10	5.00	-	-
Kinston Water and Sanitation Project (KSA) Phase 1 - Mona & Hope WTPs. C	15.6	15.58					-	-	-	-	-
KMA -Water Supply Improvement Project - 26 Facilities	15.9	10.82	5.08				-	-	-	-	-
KMA Water Supply Improvement Project - KSA NRW Reduction	50.9	5.53	15.30	10.44	9.72	9.93	-	-	-	-	-
KMA Water Supply Improvement Project - Forest Hill/Red Hills Works - Water S	5.0	-	0.74	1.42	1.42	1.42	-	-	-	-	-
KMA Water Supply Improvement Project - Artificial Recharge	9.2	0.10	5.21	3.91			-	-	-	-	-
KMA Water Supply Improvement Project - Forest Hill/Red Hills Works Transmis	6.0	0.19	0.27	2.82	2.72		-	-	-	-	-
KMA Water Supply Improvement Project - Rural Towns	21.0	1.52	2.16	15.16	2.16		-	-	-	-	-
KMA Water Supply Improvement Project Energy Efficiency	8.3	0.12	8.14				-	-	-	-	-
KMA Water Supply Improvement Project - Institutional Strengthening Training/D	19.6	6.03	8.17	5.40			-	-	-	-	-
KMA Water Supply Improvement Project - Programme Admin. Auditing, Monitori	8.6	1.08	1.93	1.83	1.83	1.93	-	-	-	-	-
KMA (JICA) Water Supply & Rehabilitation Project	14.5	8.17	6.34	-	-	-	-	-	-	-	-
Port Antonio Water Supply, Sewerage and Drainage - Stage No. I	17.1	2.20	12.30	2.60	-	-	-	-	-	-	-
Port Antonio Water Supply, Sewerage and Drainage - Stage No. II	23.0	-	-	-	-	10.00	13.00	-	-	-	-
Sewerage Works - K - Factor											
CReW - Caribbean Regional Fund for Waste wastewater Management Phase 1	11.6	3.68	3.32	4.50	0.08	-	-	-	-	-	-
Wastewater Treatment Plants Rehabilitation - K Factor	40.0	-	1.00	4.00	15.00	10.00	5.00	5.00	-	-	-
Rationalization and expansion of sewage network in KSA - North	80.0	-	1.00	1.50	1.50	15.00	20.00	20.00	11.00	10.00	-
Rationalization and expansion of sewage network in KSA - Sector F	8.1	2.00	5.00	1.10	-	-	-	-	-	-	-
Portmore Sewerage Reconfiguration Project	23.6	-	12.13	10.90	0.62	-	-	-	-	-	-
Soapberry WWTP Module No.2	50.0	-	-	-	5.00	15.00	25.00	5.00	-	-	-
Harbour View WWTP Phase II&III	4.9	-	4.20	0.70	-	-	-	-	-	-	-
Upgrading of the Ocho Rios STP	0.7	-	-	-	-	-	-	0.20	0.50	-	-
The Down Town Kingston Sewerage rehabilitation	16.3	-	-	5.00	5.00	5.00	1.28	-	-	-	-
Rationalization and expansion of sewage network in KSA - Central Kingston	4.5	-	-	-	-	-	1.00	2.50	1.00	-	-
Central Sewerage Systems - Parish Capital/Major Towns											
Spanish Town Sewerage and New WWTP	25.0	-	-	-	-	3.00	10.00	10.00	2.00	-	-
KMA Wastewater Phase 2B	5.0	-	-	-	-	-	-	1.00	3.00	1.00	-
Savanna la mar Sewerage and New WWTP	45.0	-	-	-	-	-	2.00	20.00	20.00	3.00	-
Relocation of the Negril WWTP and extension of Sewer network	40.0	-	-	5.00	20.00	10.00	5.00	-	-	-	-
May Pen Sewerage and New WWTP	25.0	-	-	-	2.00	10.00	10.00	3.00	-	-	-
Old Harbour Sewerage and WWTP	40.0	-	-	-	-	4.00	11.00	20.00	5.00	-	-
Falmouth Sewerage System (New WWTP)	45.0	-	-	-	-	-	5.00	20.00	15.00	5.00	-
Port Maria Sewerage and WWTP	35.0	-	-	-	-	-	-	2.00	15.00	15.00	3.00
Montego Bay (extension of the network)	40.0	-	-	-	-	-	5.00	10.00	20.00	5.00	-
ICT Instruments & Support Services etc.	18.1	-	-	-	2.00	15.00	1.07	-	-	-	-
Call Centre	0.2	-	-	-	0.11	0.10	-	-	-	-	-
Head Office NWC Complex at Marescaux Road.	2.5	-	-	0.50	1.00	0.75	0.25	-	-	-	-
Cornwall County Projects- Five (5) Parishes	250.0	-	-	-	-	25.00	25.00	25.00	25.00	75.00	75.00
Rural Water Supply Schemes - Upgrade and Rehabilitation of six (6) rural WSS	40.5	-	-	10.00	10.46	15.00	5.00	-	-	-	-
Capital Projects - Engineering and Project Delivery	35.3	-	-	-	20.00	15.30	-	-	-	-	-
In-House Capital Project - Operational Areas - Tech Services etc.	5.0	-	4.96		-	-	-	-	-	-	-
K-FACTOR - NRW	300.0	-	23.00	47.00	50.00	10.00	10.00	10.00	50.00	50.00	50.00
GRAND TOTAL, US$million	1,498	83.6	150.5	146.8	150.6	176.4	160.7	164.8	172.5	164.0	128.0
GRAND TOTAL, J$billion	178	8.2	15.3	15.5	16.6	20.2	19.1	20.4	22.3	22.0	17.9

Source: NWC

K-FACTOR Capital Expenditure Projects

Table 7.1: K-Factor Projects Approved by OUR as at July 31, 2013 (Summary)

Project Type	# of projects	Estimated Cost (J$b)
NRW Reduction /Water Supply Improvement	67	24.174
Sewerage/Wastewater Treatment	33	7.190
Total	100	31.364

Source: OUR Records

As can be seen from Table 7.1, since the implementation of the K-Factor in 2008, up to July 2013, the OUR has approved one hundred (100) capital projects as being eligible for funding at an estimated project cost of approximately J$31.36B. **Annex 4** outlines the list of approved projects.

Table 7.2 Proposed K-Factors CAPEX for 2014-2018

Project Type	Project Name	Final Year	Total (US$ M)	2013	2014	2015	2016	2017	2018
Energy Efficiency Projects	**KMA Water Supply Improvement Project Energy Efficiency**	**2017**	**8.26**	**0.12**	**8.14**	**0**	**0**	**0**	**0**
Sewerage Projects	CReW - Caribbean Regional Fund for Waste wastewater Management Phase 1	2016	11.58	3.68	3.32	4.5	0.08	0	0
	Wastewater Treatment Plants Rehabilitation - K Factor	2019	35	0	1	4	15	10	5
	Rationalization and expansion of sewage network in KSA - North	2021	39	0	1	1.5	1.5	15	20
	Rationalization and expansion of sewage network in KSA - Sector F	2015	8.1	2	5	1.1	0	0	0
	Portmore Sewerage Reconfiguration Project	2016	23.65	0	12.13	10.9	0.62	0	0
	Harbour View WWTP Phase II&III	2015	4.9	0	4.2	0.7	0	0	0
Sewerage /NRW Reduction Projects	Kingston Water and Sanitation Project (KSA) Phase 1 - Mona & Hope WTPs. Construction of Darling Street PS	2017	4.58	4.58	0	0	0	0	0
NRW Reduction Projects	Jamaica Water Supply Improvement Project (JWSIP) Category 'B'	2015	52.43	19.95	22.73	9.75	0	0	0
	KMA Water Supply Improvement Project - KSA NRW Reduction	2017	50.91	5.53	15.3	10.44	9.72	9.93	0
	KMA (JICA) Water Supply &	2014	8.17	8.17	0	0	0	0	0

* Project includes both Sewerage and NRW Reduction components

** Exchange rate of J$102:US$1

Chapter 8: Rate Base and Return

8.1 Cost of Capital

The NWC is allowed to recover a reasonable return on its investment through the tariff that is charged to its consumers. This return is compensation for capital which is invested in the regulated asset base and is computed by the application of a rate of return to the asset base of the Commission. Both the rate of return and the asset base of the NWC are approved by the OUR. The approved rate of return will give the NWC a reasonable opportunity to earn a return that will enable it to provide high service quality to its customers and also to acquire additional capital investments at competitive prices. The overall rate of return is the weighted average cost of capital (WACC) and is calculated as the weighted average cost of both the long-term debt and the equity components of the capital structure.

8.2 Cost of Debt

Consistent with the last tariff review, the OUR will continue to use the actual cost of the long term debt in the computation of the revenue requirement. In computing the cost of debt the OUR relied on information submitted by NWC on its long term loan portfolio. The gearing ratio of the NWC is comparable to international standards in water and sewage sectors. This approach is also consistent with the 2008 Tariff Determination Notice.

To compute the actual cost of long term debts, the weighted average loan interest rate is applied to the debt portion of the capital base less K-factor portion of the loans.

The Office determines that the applicable weighted average interest rate on long term debt is 5.8% of $16.040B

8.3 Cost of Equity

The cost of equity proposed by the NWC was estimated with the use of the Capital Asset Pricing Model (CAPM). This methodology is widely used and is accepted by the OUR in deriving the NWC's cost of equity. NWC estimates the required return on equity investments to be 18.2 percent in US dollar nominal terms and 16.0 percent in real terms.

The appropriate cost of equity for the cost of service computation is expressed in real terms as the PAM allows for foreign exchange and inflation adjustments. In computing the cost of equity NWC relied on the following set of papers and data produced by Dr. Aswath Damodaran, a Professor of Finance at the Stern School of Business of New York University:

- Damodaran, Aswath. "*Damodaran on Valuation: Security Analysis for Investment and Corporate Finance*, " Second edition, John Wiley and Sons, 2006
- Damodaran, Aswath. "*Levered and Unlevered Betas by Industry: Global Dataset*," 2012[5]
- Damodaran, Aswath. "*Country Default Spreads and Risk Premiums Dataset*," 2012[6]
- Damodaran, Aswath. "*Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2002 Edition," 2012*[7]
- Damodaran, Aswath. *"Measuring Company Exposure to Country Risk: Theory and Practice," 2003*[8]
- Damodaran, Aswath. *"Estimating Risk Parameters."*[9]
- Damodaran, Aswath. *"Volatility Rules: Emerging Market Companies".* September 2009[10]

The CAPM is represented as follows:

$$\boldsymbol{Cost\ of\ Equity(nominal) = R_f + \beta_E\ (MMRP + CRP)}$$

Where:

R_f = Risk free rate

β_E = Equity beta

MMRP = Mature Market Risk Premium

Risk free rate (R_f)

CRP = Country Risk Premium

[5] Accessed January 2013 at: http://people.stern.nyu.edu/adamodar/
[6] Ibid
[7] Ibid
[8] Ibid
[9] Ibid
[10] Ibid

8.3.1 The **Risk free rate** is the nominal interest rate that can be obtained by investing in financial instruments with no default risks. The NWC uses 1.80 percent as the risk free rate. This is the average interest rate on 10 year US Treasury bonds between January 2012 and December 2012.

There are opposing views regarding whether the risk-free rate should be approximated using a short-term security or a long term-security. A short-term security would seemingly be the better option for estimating the risk free rate as a longer time period would be increasing the probability of default by the debtor. Also, over a short time period, less reinvestment is needed to equate actual return with expected return and so there is lower reinvestment risk. However, short-term interest rates tend to be more volatile than long-term interest rates. There is a great degree of consensus that a long-term security should be used where the analysis is long-term and a short-term security where the analysis is short-term.

The NWC's goal should be to match debt tenure to its average asset life span. Given the types of assets in which the NWC invests, this would lead to the decision to use mostly longer-term debt instruments to finance these investments. In light of this, the 10-year U.S. Treasury bond is an appropriate measure of a long-term risk-free rate of return. The information can be sourced publicly where it is presented in nominal terms.

NWC in its computation used the average interest rate on 10 year US Treasury bonds between January 2012 and December 2012. The CAPM is a forward-looking technique and as such the values chosen for the variables in the CAPM should generally be prospective even if they are estimated using retrospective data.[11] Shapiro and Balbirer

[11] Aswath Damodaran, December 2008, 'What is the risk-free rate? A Search for the Basic Building Blocks *"... Common (and dangerous) practices when confronted with rates that deviate from what they regard as "normal", analysts often substitute what they feel is a more normal rate when valuing companies. If the Treasury bond rate is 3.5%, an analyst may decide to use 5% as the normal risk-free rate in a valuation. Though this may seem logical, there are three potential problems. The first is that "normal" is in the eyes of the beholder, with different analysts making different judgments on what comprises that number. To provide a simple contrast, analysts who started working in the late 1980s in the United States, use higher normal rates than analysts who joined in 2002 or 2003, reflecting their different experiences. The second is that using a normal risk-free rate, rather than the current interest rate, will have valuation consequences. For instance, using a 5% risk-free rate, when valuing a company, will lower the value that you attach to the company and perhaps make it over valued. However, it is unclear whether*

(2000, pg. 329) states that one of the common errors in using the CAPM to calculate the risk-adjusted cost of capital is "*using the historical average Treasury bond or Treasury bill return as the risk-free rate in the CAPM instead of using the actual (current) rate. You must use the current risk-free rate.*" As such, the OUR will not accept the average of the Treasury yields of 1.80% and instead will use the current rate of 1.72% as at December 2012.

The Office determines that the applicable Risk free rate of return is 1.72%.

8.3.2 The equity beta (β_E)

Beta is a measure of the correlation between the company's risk and general market risk. The OUR shares NWC's view that *"Deriving an estimate of an equity beta for an investment in a country (or set of countries) whose stock market is small, non-existent, or has a short history is imprecise. Since this is the case for Jamaica, we [NWC] recommend using an average asset beta of water utilities in the world."* In this regard the NWC adapted the Damodaran estimates of 0.50 for water utility asset beta for the period dated January 2012.

The current available Damodaran revised estimates as at January 2013 shows that the global asset beta remains unchanged at 0.50. The equity beta for NWC can therefore be calculated based on its current capital structure (49.5 percent debt, 50.5 percent equity) using the following formula:

$$\beta_E = \beta_A + (\beta_A) \times (\frac{D}{E})$$

Where:

β_E is the equity beta

β_A is the asset beta

D is the percent of a company financing from debt

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that conclusion is a result of the analyst's view on interest rates (i.e., that they are too low) or on the company. Finally, interest rates generally change over time because of changes in the underlying fundamentals. Using a normal risk-free rate, which is different from today's rate, without also adjusting the fundamentals that caused the current rate, will result in inconsistent valuation…"

E is the percent of company financing from equity

This results in an equity beta of 1.09.

The Office determines that the applicable equity beta is 1.09

8.3.3 Mature Market Risk Premium (MMRP)

The Mature Market Risk Premium is the expected return over the risk free rate that investors require in order to invest in a well-diversified portfolio of risky assets in a mature market. The MMRP is calculated as the expected return on the market minus the risk free rate. We use a nominal mature market risk premium of 6.00 percent, based on papers and data published by Damodaran using an implied equity premium.

The Office determines that the applicable MMRP is 6.0%.

8.3.4 Country Risk Premium (CRP)

Country risk relates to the likelihood that changes in the business environment will occur that reduce the profitability of doing business in a country. Macro-socio-economic factors such as political instability, volatile exchange rates and economic instability lead investors to be wary of overseas investment opportunities. These factors can adversely affect operating profits as well as the value of assets and thus require a premium for investing. The CRP is higher for developing markets than for developed nations. A number of methods have been employed in the measurement of CRP and in deriving the CRP NWC adopted the approach of Damodaran. Under this approach, the CRP is equated to the country's sovereign default risk premium multiplied by the ratio of emerging market equity volatility to bond volatility. NWC explains these two components as follows:

"*Damodaran estimates the **sovereign default risk premium** by comparing the difference in long term government bond yields between countries that have default risk with countries that are considered risk free. Jamaica is rated B3 by Standard & Poor's. Damodaran estimates a sovereign default risk premium of 6.00 percent for countries with*

B3 ratings.

*The **ratio of bond volatility to equity volatility** represents the expected difference in riskiness between equity investments and government bonds in a country. Damodaran estimates that equity markets are 1.5 times more volatile that debt markets in emerging markets. Following Damodaran's approach of multiplying a country's default spread (6.00 percent) by the ratio of the volatility of equity markets to bond volatility yields a country premium for the NWC of 9.00 percent."*

8.3.5 Another method that is used in deriving CRP is the **difference in yield curves**. The yield on Jamaican 10 year US$ denominated Treasury and corporate bonds data which are traded in Jamaica are sourced from the Bank of Jamaica. These yields can be compared to the USA Treasury bond data for 10 year US$ denominated bonds traded in the USA. The difference in the yields between these two sets of yield data is used to infer an estimate of the country risk premium. Investors would expect that this is the premium for investing in Jamaica as opposed to investing in the USA. This premium excludes a return to compensate for the exchange rate risk of converting Jamaican dollar to United States dollars, because the bonds are both denominated in United States dollars.

8.3.6 The Nelson-Siegel model

Good estimates of the term structure of interest rates (also known as the spot rate curve or the zero bond yield curve) are of the utmost importance to investors and policy makers. One of the term structure estimation methods, initiated by Bliss and Fama (1987), is the smoothed bootstrap. Nelson and Siegel (1987) and Svensson (1994, 1996) therefore suggested parametric curves that are flexible enough to describe a whole family of observed term structure shapes.[12]

The Nelson-Siegel model is extensively used by central banks and monetary policy makers (Bank of International Settlements (2005), European Central Bank (2008)). Fixed-income portfolio managers use the model to immunize their portfolios (Barrett, Gosnell and Heuson (1995) and Hodges and Parekh (2006)) and recently, the Nelson-Siegel model also regained popularity in academic research. Dullmann and Uhrig-

[12] Annaert, J., Claes A.G.P., De Ceuster, M. J.K. and Zhang, h. "Estimating the yield curve using the Nelson-Siegel Model – A Ridge Regression Approach"

Homburg (2000) use the Nelson-Siegel model to describe the yield curves of Deutsche Mark denominated bonds to calculate the risk structure of interest rates. Fabozzi, Martellini and Priaulet (2005) and Diebold and Li (2006) benchmarked Nelson-Siegel forecasts against other models in term structure forecasts, and they found it performed well, especially for longer forecast horizons. Martellini and Meyfredi (2007) used the Nelson-Siegel approach to calibrate the yield curves and estimate the value-at-risk for fixed-income portfolios. Finally, the Nelson-Siegel model estimates are also used as an input for affine term structure models.[13]

The Nelson-Siegel Function

$$y(t) = \alpha_1 + (\alpha_2 + \alpha_3)\frac{\beta}{t}\left(1 - e^{-t/\beta}\right) - \alpha_3 e^{-t/\beta}$$

We have adopted the Nelson-Siegel model to estimate Jamaica's country risk premium.
Of the two approaches mentioned above it is the considered view that the difference in yield curve is a more realistic measure of country risk for Jamaica. As such, the OUR will use the CRP as at December 31, 2012.

The Office determines that the applicable CRP is 4.33%[14].

8.3.7 The $\boldsymbol{Cost\ of\ Equity(nominal)} = \mathbf{R_f} + \boldsymbol{\beta_E}\ \mathbf{(MMRP + CRP)}$

$= \mathbf{1.72\% + 1.09(6.0\% + 4.33\%)}$

$= \mathbf{13.0\%}$

The Office determines that the Cost of Equity is 13.0 percent in US dollar nominal terms.

Projected Inflation

Projected inflation is computed as the difference between average, monthly yields on 10-year US Treasury bonds and the inflation indexed, 10-year Treasury bonds as at December 31, 2012. The inflation-indexed Treasury bond represents a real interest rate, so the difference between this yield and the nominal 10 Year treasury yield reflects investors' expectations for inflation over the term of the bond.

[13] Ibid.

[14] See Table 1 in the Appendices

US 10-year Treasury bonds			
Month	Inflation Indexed	Nominal	Projected Inflation
2012-01	-0.11	1.97	2.08
2012-02	-0.25	1.97	2.22
2012-03	-0.14	2.17	2.31
2012-04	-0.21	2.05	2.26
2012-05	-0.34	1.80	2.14
2012-06	-0.50	1.62	2.12
2012-07	-0.60	1.53	2.13
2012-08	-0.59	1.68	2.27
2012-09	-0.71	1.72	2.43
2012-10	-0.75	1.75	2.50
2012-11	-0.77	1.65	2.42
2012-12	-0.76	1.72	**2.48**

Source: http://www.federalreserve.gov/releases/h15/data.htm

$$\text{The } \boldsymbol{Cost\ of\ Equity(real)} = \frac{\boldsymbol{cost\ of\ equity(nominal) - expected\ inflation}}{\boldsymbol{1 + expected\ inflation}}$$

$$= (13.0\% - 2.48\%)/\ (100\% + 2.48\%)$$

$$= 10.26\%$$

The Office determines that the Cost of Equity is 10.26 percent in US dollar real terms.

8.3.8 **Equity Base**

As stated in the last tariff review, the Office will only calculate a return on equity that is invested by the NWC, as the government contributions to the capital base seeks to offset the rates to be passed through to customers. The Office has examined the NWC accounts and has concluded that the Commissions' equity is $15.7B. This consists of revaluation reserves and accumulated deficit.

	OUR	NWC
Risk free rate (%)	1.72	1.80
Equity Beta	1.09	1.09
MMRP (%)	6.00	6.00
CRP (%)	4.33	9.00
Inflation (ex)	2.48%	1.90%
Asset Beta	0.50	0.50
Debt	54.2%	54.2%
Equity	45.8%	45.8%
Int. Rate on Debt	5.8%	5.8%

8.3.9 The Weighted Average Cost of Capital (WACC)

The overall rate of return is the weighted average cost of capital (WACC) and is calculated as the weighted average cost of both the long-term debt and the equity components of the capital structure.

WACC (Real) = Debt Ratio x Cost of Debt + Equity Ratio x Cost of Equity
WACC (Real) = 54.2% * 5.8% + 45.8% * 6.52%
WACC (Real) = 6.13%

The OUR determines that the Weighted Average Cost of Capital (WACC) is 7.8 percent in US dollar real terms

	Cost of Debt	ROE Nominal	ROE Real	WACC (Real) Pre Tax
OUR	5.8%	9.16%	6.52%	6.13%
NWC	5.8%	18.18%	15.97%	10.46%

CHAPTER 9: REVENUE REQUIREMENT

9.1 Revenue requirement is the amount of funds a company requires to be financially viable whilst delivering an acceptable quality of service to its customers. The Office determines the revenue requirement on an accrual basis, where the incorporation of cash and non-cash items are included in its budgeted operating expenses.

9.2 Revenue requirement is the sum of total operating expenses including depreciation, taxation and return on the rate base.

9.3 Total operating costs is as determined in Chapter 5.

9.4 The return on investment is to compensate NWC for making investments in its water and sewerage infrastructure net of K-factor approved projects.

9.5 The NWC is liable to pay taxes and as such taxation was considered when determining the revenue requirement.

9.6 The Office has determined that the total operating costs for the 2013/2014 financial period is $23.7B. The NWC has proposed that its total cost would be over $25.3B for the same period. Table 9.1 outlines the estimated operating costs.

Table 9.1: Breakout of Office determined total expenses

Details	Water '000	Sewerage '000	TOTAL '000
Total Salaries	$4,748,760	$1,339,754	$6,088,515
Total R&M	$1,743,447	$545,221	$2,288,669
Total administration	$2,407,176	$724,932	$3,132,108
Electricity	$6,188,048	$372,723	$6,560,771
Telephone	$86,342	$26,371	$112,713
Fuel & Lubrication	$213,156	$56,341	$269,497
Regulatory fees	$37,746	$37,746	$75,492
Water Purchase	$296,435	$0	$296,435
Soapberry Cost	$0	$971,497	$971,497
Loan Interest	$716,351	$213,975	$930,326
Depreciation	$2,322,848	$693,838	$3,016,686
TOTAL	**$18,760,310**	**$4,982,397**	**$23,742,709**

9.7 Equity is also referred to as a company's net worth and can be defined as the residual amount left after deducting the company's obligations from its resources. NWC's equity base is calculated as $15.7B and it is determined based on the financial status of the Commission in its test year. When the cost of equity is applied to the Office determined equity base, it yields a pre-tax return on equity of $2.4B.

9.8 NWC is now obligated to pay taxes to the government and therefore the Office has included taxation in the calculation of the revenue requirement.

9.9 The Office has determined that the total revenue required is $26.1B (see Table 9.2).

Table 9.2 Office determined Revenue Requirement

Building Blocks	Water	Sewerage	Total
	'000	'000	'000
Total Expenses	$18,760,309.62	$4,982,398.00	$23,742,709.01
Equity base	$12,110,536.13	$3,617,432.87	$15,727,969.00
Cost of equity real	10.26%	10.26%	10.26%
Return on equity	$1,242,541.01	$371,148.61	$1,613,689.62
Taxes	$618,821.83	$188,010.88	$806,832.71
Pre-Tax return on equity	$1,856,484.04	$564,038.28	$2,420,522.33
Total Revenue Requirement	$20,616,793.66	$5,546,436.28	$26,163,231.34

9.10 **Estimated Revenues**

The Office has taken the actual audited operating revenues for both water and sewerage services (net of PAM, K-Factor and X-Factor) for the financial year 2012/2013 and made adjustments for changes in the PAM variable up to July of 2013. The above adjustments to the audited 2012/2013 operating revenue give an estimated normalised amount of revenues totalling $22.5B which is allocated $17.4B to water services and $5.1B to sewerage services.

9.11 Table 9.3 below shows the expected revenue shortfall resulting from the Commission's operation.

Table 9.3: Revenue shortfall

Category	Water $'000	Sewerage $'000	Amount $'000
Total revenue requirement	$20,616,794	$5,546,436	**$26,163,231**
Projected Revenue	$17,380,489	$5,132,774	**$22,513,263**
Shortfall	$3,236,305	$413,662	$3,649,969
Increase	**19%**	**8%**	**16%**

9.12 An overall increase of eighteen percent (16%) is allowed to the NWC 19% increase in water rates and a 8% increase in sewerage rates. Since this is the net amount required in

the adjusted test year, by implication the X-factor would be reset to zero.

Chapter 10: RATE STRUCTURE

10.1 WATER RATES

The Office has determined that the effective increase of NWC Rates shall be nineteen percent (19%) in water and eight percent (8%) in sewerage.

10.2 The rates are effective as at October 3, 2013, shall be as shown in Table 10.1

Table 10.1 National Water Commission Rate Schedule

Rates and Charges	Effective rate inclusive of PAM April 2013	Effective Increase 2013/2014
Service Charges		
Where the size of the meter does not exceed		
5/8 inch/15mm	$574.86	$684.09
3/4 inch/20mm	$1,179.94	$1,404.13
1 inch/25mm	$1,543.05	$1,836.23
l¼ inch/30mm	$2,904.57	$3,456.43
1 1/2 inch/40mm	$2,904.57	$3,456.43
2 inch/50mm	$4,114.74	$4,896.54
3 inch/75mm	$7,473.21	$8,893.12
4 inch/100mm	$12,072.04	$14,365.73
6 inch/150mm	$18,395.47	$21,890.61
WATER RATES		
Domestic Consumers (Imperial Metered)—		
For up to 3,000 gallons at a rate of	$327.75	$390.02
For the next 3,000 gallons at a rate of	$577.81	$687.59
For the next 3,000 gallons at a rate of	$623.87	$742.41
For the next 3,000 gallons at a rate of	$796.29	$947.59
For the next 8,000 gallons at a rate of	$991.73	$1,180.16
Over 20,000 gallons at a rate of	$1,276.55	$1,519.09
Domestic Consumers (Metric Metered)—		
For up to 14,000 litres at a rate of	$72.06	$85.75
For the next 13,000 litres at a rate of	$127.06	$151.21
For the next 14,000. litres at a rate of	$137.20	$163.27
For the next 14,000 litres at a rate of	$175.12	$208.40

For the next 36,000 litres at a rate of	$218.07	$259.50
Over 91,000 litres at a rate of	$280.72	$334.05
Commercial and Industrial Consumers—		
Imperial metered	$1,229.00	$1,462.51
Metric metered	$270.22	$321.57
Condominiums—		
Imperial metered	$609.66	$725.49
Metric metered	$134.04	$159.51
Primary Schools—		
Imperial metered	$491.63	$585.04
Metric metered	$108.11	$128.65
SEWAGE RATES		
Domestic Consumers (Imperial Metered)—		
For up to 3,000 gallons at a rate of	$327.75	$353.97
For the next 3,000 gallons at a rate of	$577.81	$624.04
For the next 3,000 gallons at a rate of	$623.87	$673.78
For the next 3,000 gallons at a rate of	$796.29	$860.00
For the next 8,000 gallons at a rate of	$991.73	$1,071.07
Over 20,000 gallons at a rate of	$1,276.55	$1,378.67
Domestic Consumers (Metric Metered)—		
For up to 14,000 litres at a rate of	$72.06	$77.83
For the next 13,000 litres at a rate of	$127.06	$137.23
For the next 14,000. litres at a rate of	$137.20	$148.18
For the next 14,000 litres at a rate of	$175.12	$189.13
For the next 36,000 litres at a rate of	$218.07	$235.51
Over 91,000 litres at a rate of	$280.72	$303.18
Commercial and Industrial Consumers—		
Imperial metered	$1,229.00	$1,327.32
Metric metered	$270.22	$291.84
Condominiums—		
Imperial metered	$609.66	$658.43
Metric metered	$134.04	$144.76

Primary Schools—		
Imperial metered	$491.63	$530.96
Metric metered	$108.11	$116.76
MISCELLANEOUS FEES		**Effective 2013/2014**
Disconnection and Reconnection Fee—	$798.00	$798.00
Domestic Unmetered Services (Locked)	$3,547.00	$3,547.00
Removal and Replacement of Service		
(Unmetered)	$798.00	$798.00
Domestic Metered Service (Locked)		
Domestic Metered Service Removed	$7,099.00	$7,099.00
and Replaced ~/s inchll5mm and		
% inch/2Omm		
	$10,652.00	$10,652.00
Domestic Metered Service Removed and		
Replaced 1 inch/25mm and over	$798.00	$798.00
Commercial Metered Service (Locked)		
	$10,652.00	$10,652.00
Commercial Metered Service Removed and Replaced		
Illegal Connections, Domestic and		
Commercial, the actual cost of		
Leak Detection and/or Repair, the actual cost of		

10.3 Shipping rates are to be charged at the commercial rates.

10.4 Sewerage Rates

Customers have consistently raised concerns about their sewerage rates being 100% of water rates. The Office instructed the NWC to develop a set of accounts that will adequately separate the cost of providing water services from that of conveyance, treatment and disposal of sewage. The Office was cognizant that for some time now the audited financials of the Commission provided some degree of cost allocation to water

and sewerage. It was envisaged that complete separation would not have been particularly difficult. It is clear from the submissions from the NWC however that there is still some way to go before its accounts are presented in such a way as to allow for precise cost separation. Notwithstanding, the OUR utilised the information provided in NWC's report to achieve some degree of cost separation and to establish different rates for water and sewerage services.

10.5 The Office once again enjoins NWC to present its regulatory accounts in a form which will allow it to effectively analyse the activities in both the water and sewerage sector. This will enable detailed analysis of both business streams and provide a more informed basis on which to chart the future regime for tariffs for sewerage services. Table 10.1 above outlines the effective sewerage rate increase of ten percent (10%).

10.7 Price Adjustment Mechanism (PAM)

10.7.1 The PAM is a tool that is applied to customers' bills on a monthly basis for water and sewage services to index the base rate charged for the services to ensure that the determined revenue of the NWC is preserved in real terms. That is, the PAM seeks to compensate NWC monthly for movements in the costs of inputs over which the company has no control. Currently, the PAM corrects for movement in the CPI, Jamaican dollar exchange rate relative to the US dollar, and electricity price. The PAM is applied to customer bills on a monthly basis. The PAM formula is as follows:

$$PAM = \left[w_{fe} * \Delta FE + w_{cpi} * \Delta CPI + w_{ec} * \Delta kwh\right]$$

Where,

ΔFE is the percentage change in the J$/US$ exchange rate;

ΔCPI is the percentage change in the Consumer Price Index;

Δkwh is the percentage change in the kilowatt hour charge for electricity;

w_{fe} is the weight associated with J$/US$ exchange rate;

w_{cpi} is the weight associated with the Consumer Price Index; and

w_{ec} is the weight associated with the kilowatt hour charge for electricity;

10.7.2 The NWC proposed that the structure of the PAM be adjusted to make it more cost

reflective. In this regard, the Commission suggested that the weights associated with each factor in the PAM be adjusted to reflect the impact that change in costs of such on total expenses. The NWC also proposed a direct pass through of all bulk purchase costs for water and wastewater whenever these are approved by the OUR. The NWC further recommended that the components which constitute the PAM be expanded to include two additional variables – Wage index and Asset Revaluation Index:

$$PAM = \left[w_{fe} * \Delta FE + w_{cpi} * \Delta CPI + w_{ec} * \Delta kwh + w_{wi} * \Delta WI + w_{ar} * \Delta AR\right]$$

Where,

ΔFE is the percentage change in the J$/US$ exchange rate;

ΔCPI is the percentage change in the Consumer Price Index;

Δkwh is the percentage change in the kilowatt hour charge for electricity;

ΔWI is the percentage change in the Jamaican Wage Index;

ΔAR is the percentage change in the Asset Revaluation Index;

w_{fe} is the weight associated with J$/US$ exchange rate;

w_{cpi} is the weight associated with the Consumer Price Index;

w_{ec} is the weight associated with the kilowatt hour charge for electricity;

w_{wi} is the weight associated with the Jamaican Wage Index; and

w_{ar} is the weight associated with the Asset Revaluation Index.

10.7.3 Under the NWC's proposal, the Jamaican Wage Index is to be calculated using data on "*Average wage of Wage Earners in Large Establishments, by Major Industrial Groups in JMD ($)*" from the "*Employment, Earnings and Hours Worked in Large Establishments*" report published by the Statistical Institute of Jamaica (STATIN). The Asset Revaluation Index is to be calculated using the same index which NWC used to revalue its assets for the current 2013 tariff submission. The Asset Revaluation Index is discussed in Chapter 3.

10.7.4 The NWC indicated that it intended to use the "*Average wage of Wage Earners in Large*

Establishments, by Major Industrial Groups in JMD ($)" from the "*Employment, Earnings and Hours Worked in Large Establishments*" report published by STATIN to adjust for changes in salaries/wages. This proposed Wage Index does not necessarily reflect changes in salaries at the NWC however and therefore would not be a good proxy.

10.7.5 The OUR acknowledges that NWC is a Government entity and as such would need to pay any agreed wage increase stipulated by the Government. Nevertheless, the OUR is not in agreement with NWC's proposal with regard to the treatment of wages/salaries. Salary cost is currently adjusted in the PAM using CPI. An inflation adjustment will likely be sufficient to cover any salary increase paid by the Commission. Against the background of the recently signed agreement with the International Monetary Fund (IMF), the OUR does not envisage a situation where the Government would agree to any wage increase with Public Sector workers which is above the inflation rate. Further, Public Sector employees and the Government have signed off on a memorandum of understanding (MOU) which covers the 2012-2014 contract periods and dictates that there will be a wage freeze implemented over the periods. The effect of this is that NWC is likely to realize savings on its salary costs, as there will still be an automatic CPI adjustment during the period.

10.7.6 The NWC indicated that the current tariffs are under recovering costs because the Commission's assets have not been re-valued since 2002. As such, the amount recouped in the rate base for depreciation expense and return on equity is lower than actual costs. In the 2003 rate review, the Office instructed the Commission to "*develop an indexation mechanism to adjust the value of assets in between the years of asset revaluation. The revaluation of assets should be done every 5 years. This mechanism should be agreed with auditors and applied in the 2004/05 financial year*". Although the Auditors have accepted the revaluation by indexation, the OUR is not convinced that the revaluation formula accurately reflects the current asset values. The methodology used for revaluation factors in the physical condition of the assets and given the need for a K-factor programme to effect replacement and rehabilitation a mere movement by indexation on a 2002 base is not sufficient to provide a true reflection of current asset values. The indexation mechanism was only intended to be used in between a comprehensive revaluation. Therefore, this index will not be included in the PAM.

10.7.8 In the past, the weights used for the factors in the PAM have been based on the share of costs for the relevant variables from the test year. However, the Office has no objection to NWC's proposal to calculate the weights for the factors of the PAM using the projected cost for the various expenditure items from the base year.

Pass Through of Bulk Purchase Costs

10.7.9 The Office acknowledges that the Commission has no direct control over the tariffs charged by suppliers of bulk/wastewater as these rates are determined by the OUR. The tariff for the treatment of sewage at Soapberry has been determined by the OUR and is included in the operating costs of the NWC. This tariff is in effect for two (2) years and therefore will only fluctuate with changes in economic variables that will be compensated through the application of the PAM. The situation is similar with respect to bulk water from the Runaway Bay Water Company. The OUR's position is that NWC is adequately compensated for changes in these tariffs under the current PAM and so there is need for this change.

In light of the foregoing, the new PAM formula will remain unchanged.

$$PAM = \left[w_{fe} * \Delta FE + w_{cpi} * \Delta CPI + w_{ec} * \Delta kwh\right] * 100$$

The weight associated with the various elements of the PAM can be seen in table 10.3

Cost of Service Components	2014, J$'000	Recommended Index	Weight
OPEX			
Staff costs	6,088,515	CPI	23.27%
Repairs and maintenance	2,288,669	CPI	8.75%
Administration	3,132,108	CPI	11.97%
Electricity	6,560,771	Electricity	25.08%
Telephone	112,713	CPI	0.43%
Fuel and lubrications	269,497	CPI	1.03%
Regulatory Fees	75,492	CPI	0.29%
Water Purchases	296,435	CPI	1.13%
Soapberry Cost	971,497	CPI	3.71%
Total OPEX	**19,795,697**		

Depreciation	3,016,686	Foreign Exchange	12%
Loan Interest	930,326	Foreign Exchange	4%
Return on Equity	2,420,522	Foreign Exchange	9%
Total Cost of Service	**26,163,231**		

Index	Current Weight	NWC Proposed Weight	OUR Determined Weight
CPI	47%	31%	51%
Electricity	25%	13%	25%
Foreign Exchange	28%	4%	24%
Salary		15%	0%
Asset Revaluation		36%	0%
Total	**100%**	**100%**	**100%**

The PAM will also be reset at its anniversary (1st August) at which time the new base values for each component will be set. The annual reset for ANPAM will be based on the same formula as the PAM however the percentage change in the variables will be calculated by taking the change in the value of the variable at reset date relative to the original base value of the variable.

10.7.10 The base values for the PAM indices are chosen as at July 2013 and are as shownbelow

Electricity $31.41/kWh;
Exchange Rate J$101.76 to US$1.00; and
CPI All divisions 200.9.

10.7.11 The rates at the beginning of each year shall be derived by Base rate*(1 +ANPAM ±Z).

10.8 K-Factor

In its 2008 application for a review of the tariff, the National Water Commission (NWC) proposed to the Office that a *"K-factor be established to fund capital projects that will not generate any significant increase in revenues but are necessary for system reinforcement and reliability or to comply with regulatory intervention by the National Environmental and Planning Agency".* The Office considered the proposal and in the NWC Tariff Determination of April 28, 2008 (Document No. WAT 2001/01 – Section 9.9), approved the incorporation of a K-factor into the Tariff. Funds flowing from the regime would be placed in a special account to be used only for approved K-Factor projects. The Office's approval would also be required for each project to be funded by the K-Factor prior to its execution. It was also intended for NWC to seek loan funding where possible to implement the approved projects with the K-Factor inflows funding the loan repayments.

10.8.1 The 2008 Tariff Determination Notice stated that the "*K-Factor is to be calculated on the bill balance after the X-Factor is deducted"* with the percentages for the X-Factor and the K-Factor as shown in the Table 10.4 below.

Table 10.4: K-Factor and X-Factor as per 2008 Tariff Determination

Year Ending March	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
K-Factor	5%	14%	20%	23%	25%	27%	27%	27%	26%	26%	24%	24%	23%
X-Factor	-	5%	10%	10%	12%	12%	13%	15%	18%	22%	22%	23%	23%

Subsequent to the tariff determination and the commencement of the K-Factor programme, the OUR became concerned with the way how the programme was being administered by the NWC.

10.8.2 After a review and subsequent discussions with the NWC, on October 25, 2010, the Office and NWC agreed on a Memorandum of Understanding (MOU) regarding the operation of the K Factor program. The MOU sought to codify the responsibilities of the NWC and OUR in relation to the administration of the fund including the segregation of K-Factor proceeds, investment of K-Factor funds, withdrawals from and deposits to the K-Factor account, and the maintenance of accurate and timely records of all transaction in keeping with standard accepted accounting practice.

10.8.3 Performance of the K-Factor Programme over the period 2008 – 2013 is as shown in Table 10.5 below.

Table 10.5: K-Factor Projects Approved by OUR as at July 31, 2013 (Summary)

Project Type	# of projects	Estimated Cost (J$b)
NRW Reduction /Water Supply Improvement	67	24.174
Sewerage/Wastewater Treatment	33	7.190
Total	100	31.364

Source: OUR Records

As seen in Table 10.5 above, since the implementation of the K-Factor in 2008, the OUR has approved one Hundred (100) projects as being eligible for funding up to July 31, 2013 at an estimated project cost of approximately J$31.364B.

Projects Completed

A summary of the completed projects and the associated expenditure are shown in Table 10.6.

Table 10.6: K-Factor Completed Projects and Expenditure as at July 31, 2013 (Summary)[15]

Type	Status	Count	Expenditure (J$M)
Non Revenue Water Reduction (NRW)	Completed/(in Maintenance period)	16	6,701.81
Sewerage	Completed/(in Maintenance period)	15	486.44
	Total Expenditure	***31***	***7,188.25***

[15] Table A2 in annex 1 gives a detail list of the approved K-factor Projects

***Source: NWC K-Factor Report: Capital Expenditure as at July 31, 2013**

The data provided by NWC suggest that at least thirty-one (31) projects have been completed during the tariff period 2008 to July 2013. More than half (51%) of the completed projects relate to NRW reduction while 49% relate to sewage. Notably however, 93% of the expenditure on completed projects was in relation to NRW reduction. This level of expenditure on NRW reduction projects does not seem to have led to any reduction in the aggregate NRW for the NWC over the tariff period however. In 2008, NWC estimated the aggregate NRW to be 62%. However, as at December 31, 2012 the NWC estimated the aggregate NRW to be 68.17%. The NWC is now proposing that NRW will be reduced from 69% in 2013 to 61% in 2018.

The Office has not been presented with any quantitative data to make an informed assessment of the impact of the completed projects on the NWC's operations. In order to assess the impact and overall effectiveness and efficiency of the K-Factor programme, the Office has included in its 2013/2014 work plan, the conduct of an audit of the K-Factor programme. It is expected that this audit will be conducted by an independent consultant engaged by the OUR with terms of reference geared towards a comprehensive assessment of the programme.

10.8.4 K-Factor Fund Inflows and Outflows

Table 10.6 below shows the inflows to and outflows from the K-factor fund for the period 2008/2009 to 2012/2013.

Table 10.6: K-Factor Inflows and cumulative outflows FY 2008/9 to 2012/13)

	Financial Year				
	2008/09	2009/10	2010/11	2011/12	2012/13
	J$M	J$M	J$M	J$M	J$M
Inflow (after 95% (2008-2010)/90% deemed)	511.86	1,755.24	2,493.76**	3,457.13	3,999.79
Spent	191.72	683.27	2,796.31	3,441.87	5,104.62
Cumulative Inflow	511.86	2,267.11	4,760.87	8,218.00	12,217.78
Cumulative Spent					

	191.72	874.99	3,671.30	7,113.17	12,217.78
K-Factor Fund balance	320.15	1,392.12	1,089.56	1,104.83	-

***Source: NWC Audited Financial Statements, ** Deemed K-Factor billing reduced to 90% from 95% as at March 7, 2011**

10.8.5 Audited financial statement for 2013 also shows that there are qualifying expenditures incurred but not applied to the K-factor account due to what is termed insufficient funds amounting to $2.00B. The statement further outlined that these amounts are expected to be utilized against K-factor billings within twelve (12) months of the reporting period.

Additionally, the statement reveals that the funds spent has increased significantly in comparison to the growth in inflows. The increase in expenditure from the K-Factor Fund is a direct result of the fact that approved projects were directly funded from K-Factor inflows instead of using loan funds to implement the projects and then using K-Factor inflows to service the loans.

This reliance on direct financing of projects from inflows has severe implications for the rate at which such projects can be undertaken as the inflows may not be sufficient to directly fund project expenditure, particularly in relation to larger projects.

It may also be necessary to reconstruct the financial statements as there are indications that expenditures for which loan have been contracted were charged to the K-factor account directly rather that making the payments from loan and then applying the K-factor funds to service the repayment of principal and interest for these loans. This could constitutes serious double counting but only a comprehensive audit of the K-Factor Fund will ascertain if this is in fact the case.

10.8.6 In relation to the type of projects, over the tariff period, the majority (78%) of the funds were spent on NRW reduction projects when compared to 22% on Sewerage projects.

10.8.7 **Analysis of K-Factor CAPEX and Revenue Requirements**

Table 10.7 : NWC Projected Financing Requirements to Fund K-Factor Projects (2014-18)

Financing		2014	2015	2016	2017	2018	Total

		($JM)	($JM)	($JM)	($JM)	($JM)	($JM)
Existing approved Projects	Loan	753	753	799	1,163	1,163	4,631
	Direct	971	2,825	1,987	2353	531	8,667
Available to fund new projects**	Loan/Direct	1,938	811	2,420	2,593	5450	13,213
Total		3,663	4,389	5,206	6,109	7,144	26,511

**Source: NWC Report on funding requirements for approved projects ** NWC to fund CReW /NEPA Priority Projects and KMA Sewerage Projects*

As per Table 10.7 above, NWC has projected that approximately J$13.30B will be required over the tariff period to fund existing approved projects. Of this, approximately J$4.63B will be used to service existing loans while the remainder (J$8.67 approx.) will fund projects directly.

In seeking to establish a K-Factor for the new tariff period (2014-18), the analysis sought to determine the level to which the K-Factor should be set in order to yield at least the aforementioned J$13.30B that is required to fund existing approved projects. Given the fact that the Office has already approved these projects, it is prudent that the tariff is set to facilitate their financing. Additionally, in its tariff submission, the NWC is proposing to undertake a number of projects that require funding from K-Factor (see Annex 1). Accordingly, the K-Factor for the period 2014-2018 must also provide some funding to enable the NWC to undertake those proposed projects that are consistent with the objectives of the fund.

The Office would like to remind the NWC that it is mandated to treat with the 49 sewage facilities that were identified by NEPA as priority as indicated in the 2008 tariff determination. It must be noted that NWC has indicated that these NEPA priority projects will be implemented using K-factor and the Caribbean Regional Fund for Wastewater Management (CReW). The Office further expects that the NWC will also prioritise projects that will increase the utilisation of the Soapberry Wastewater Treatment plant.

The Office therefore encourages the NWC to utilise the K-Factor inflows over the upcoming tariff period in a manner that allows for a more vigorous implementation of projects. The NWC therefore must actively seek loan funding for K-Factor projects, with the projected inflows to support loan servicing and hence reduce its dependence upon the K-Factor fund to directly finance the implementation of projects. As can be seen in Table

10.8 below, it is projected that approximately J$26.5B will be available over the 2014-2018 period to fund K-Factor projects which include direct financing and loan servicing.

Table 10.8: Projected K-Factor Inflows (2014-18)

	NWC Projected Financing requirements for Projects – J$26.5B		
Year	**K-factor Revenue (J'000)**	**** Revenue Required (J'000)**	**K-factor**
2014	3,662,852	26,163,231	14%
	-		
2015	4,389,204	31,351,458	14%
2016	5,205,784	37,184,175	14%
2017	6,109,345	43,638,176	14%
2018	7,143,585	51,025,607	14%
Total	**26,510,770**	**189,362,646**	

**** Based on the projected Revenue Requirement as determined by the X-Factor analysis**

10.8.9 Office Decision

The approved project costs are based on the estimates that were provided by NWC to the OUR at the time of the evaluation and subsequent project approval process. It is recognised that these costs ,in many instances, are the best estimates available at that time and may vary, particularly in order to account for changes in input variables such labour costs. Accordingly it would be prudent to set the K-Factor level in such a way that would allow inflows to meet legitimate variations in project costs. Accordingly, it is the selected K-Factor level (%) should provide enough room to account for legitimate externalities. As such the Office has opted to set the K-Factor level as per the schedule at Table 10.9.

Table 10.9: Recommended K-Factor Schedule 2014-2018

Year Ending March	2014	2015	2016	2017	2018
K-Factor	14%	14%	14%	14%	14%

This Office in adopting this approach reserves the option to approve additional K-Factor projects should the need arise and were NWWC to demonstrate meaningful improvement in the returns from K-Factor.

10.8.10 The Office reserves the right to amend the schedule mid-tariff, particularly contingent upon the completion and result of the pending K-Factor audit.

10.8.11 The NWC is required to report directly on the NRW reduction achieved on each discrete K-Factor project that has been implemented to date. This shall show inter alia;

(a) Estimated NRW at time of project justification and approval;

(b) NRW after completion of the project using K-Factor funds;

(C) Any other benefits such as increase in customer base, expansion of the service as a result of having more water available; and

(d) Reduction in operating and maintenance costs including energy costs.

The NWC shall also demonstrate the impact of the program on overall NRW reduction.

The format for such a report shall be presented to the Office for its review and acceptance within ninety (90) days of the effective date of this Determination Notice. The reporting shall become effective immediately thereafter and should be submitted on a quarterly basis.

10.9 X-Factor

The NWC's Tariff requested that the efficiency or 'X' factor in the price mechanism be set at 0% for the first three years after the Tariff Review. For the last years of the review period 2013 -2017 the company has proposed that the X-factor be set at -2.3% (see Table 10.10).

Table 10.10 – NWC's Proposed X-Factor and K-Factor (2014-2023)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
K-factor	27.0%	27.0%	27.0%	26.0%	26.0%	24.0%	24.0%	23.0%	23.0%	23.0%
X-factor	0.0%	0.0%	0.0%	-2.3%	-7.4%	-11.8%	-16.6%	-20.1%	-20.9%	-23.4%

Source: *NWC Tariff Submission for the Period 2013-2018*

In presenting its preferred revenue and return on equity proposal (Option B), the Commission argued that the development of proposal was guided by the following criteria;

- *NWC should earn a zero return on equity until efficiencies start to be achieved, this is in year 2015*
- *NWC should cover its cash costs each year*
- *NWC should be allowed to earn a full return on equity the last 2 years of the regulatory period, provided efficiencies are achieved as planned.*

However, while these criteria offered some justification for the proposed X-factors on the basis of its expected revenue stream, it provided no clear explanation regarding the derivation these factors in relation to the company's projected efficiency gains.

The OUR was therefore unable to attempt any validation of the proposal on the basis of operating efficiencies linked to the proposed X-factors. In the circumstances, the OUR has developed its own model of efficiency.

Any determination of NWC's X-factor based on company-specific improvements ought to include two components, a static factor and a dynamic factor[16]. The static X-factor is concerned with how best the Commission may combine it operating resources in order to minimize the cost associated with a given level of output in the short run. The dynamic X-factor, on the other hand, addresses the effect of better technology and enhanced capital expenditure on the Commission's efficiency over the long run.

This analysis therefore develops an overall X-factor derived from an assessment of the Commission's static and dynamic capabilities. Consequently, the Commission's historic

[16] Overall X-factor = Static X-factor + Dynamic X-factor

operating performance and it projected improvements in performance including those to be derived from K-factor expenditures are taken into consideration.

It is important to note, that the approach used in the analysis focuses completely on company-specific improvement and does not take into account the external benefits that may be derived from savings to the industry resulting from technological progress taking place in the economy as a whole.

10.10 Methodology

Given that the aim of the analysis is to determine the overall X-factor it is important to delineate the analysis of static efficiency from productive efficiency. These are discussed below.

Static Efficiency

In the OUR's approach it is assumed that the main drivers of the operating and maintenance (O&M) cost for water/sewage systems are:

1. Number of connections;
2. Volume of water production
3. Length of the transmission and distribution mains

Except for the volume of water production, the variables were the same as those employed by Thanassoulis[17] in his regression model of O&M cost. The model was used in the study of the UK water companies to determine whether constant return to scale exists in the industry. The focus of Thanassoulis study was to enquire into the efficiency levels of water utilities in the UK using the Data Envelop Analysis technique. Although, the regression modeling of O&M cost was only one component of a much broader study, it has particular relevance to the analysis of efficiency in Jamaican. The model yields valuable insights into the structure of the NWC's cost and gives an indication of the responsiveness of O&M cost to key variables in the assessment of efficiency.

It should be pointed out that unlike Thanassoullis, the OUR employed the volume of water produced rather than the 'water delivered' primarily because of the high levels of non-revenue water in Jamaica. It may be argued that given high level of water loss that

[17] See Thanassoulis, E, 2000. The Use of Data Envelopment Analysis in the Regulation of UK Water Utilities: Water distribution, European Journal of Operational Research, 126:436-453

exists in Jamaica, 'water produced' rather than the 'water delivered' should better explain variations in O&M cost.

In this analysis of NWC's operating efficiency it is critical to establish the historic relationship between the Commission's O&M cost (excluding electricity costs) and the three variables identified above. Electricity cost was excluded because it is addressed in a separate analysis.

The selected method of analysis was regression modeling based on a log-linear construct described in the equation below.

Equation 1

$$\ln(OC_1) = a + b_1\ln(NC) + b_2\ln(Prd) + b_3\ln(ML)$$

Where: OC = O&M cost (in US$)

NC = No. of connections

Prd = Volume of water produced (in Mega-litres)

ML = Length of water/sewage mains

The availability of the data posed the most serious challenge to analysis. These challenges included:

- The limited data points provided by NWC for some of the variables in the time series;
- Inconsistencies between data presented in the Tariff Submission and information subsequently provided;
- An absence of any historic data on the length of the utilities transmission and distribution mains.

To resolve these issues NWC's data was supplemented with water statistics from the Economic and Social Survey of Jamaica (1994 -2008). In addition, the decision was taken to exclude the length of water/sewage mains from the regression model (see Equation 2).

Equation 2

$$\ln(OC_2) = a + b_1\ln(NC) + b_2\ln(Prd)$$

In addition a Standard Length Factor (*SLF*) was however derived by solving Equations 1 and 2 to arrive at a as proxy for *ML* (see Equations 3 and 4). Critical to the determination of *SLF* is the assumption that the base year O&M (excluding electricity) cost approved by the OUR is equal to OC_1.

Additionally, by setting the cost elasticity associated with the length of water/sewage mains (b_3) to be 0.289 and applying OUR's approved Base year O&M cost and inputs in the equations the *SLF* was determined to be 2.3885 (see Equations 3 & 4 below).

The proxy used for the cost elasticity of the length of the water/sewage mains (b_3) was taken from a study of 32 water utilities in the UK[18] based on the same conceptual construct identified in Equation 1.

Equation 3

$$\ln(ML) = \frac{\ln(OC_1) - ln(OC_2)}{b_3}$$

Equation 4

$$SLF = e^{\left(\frac{\ln(OC_1) - ln(OC_2)}{b_3}\right)}$$

It was therefore possible to project in to the future the level of NWC's O&M cost, predicated on its existing level of operating, based on its forecasted production, connection numbers and an imputed increase in the length of the network.

10.13 Dynamic Efficiency

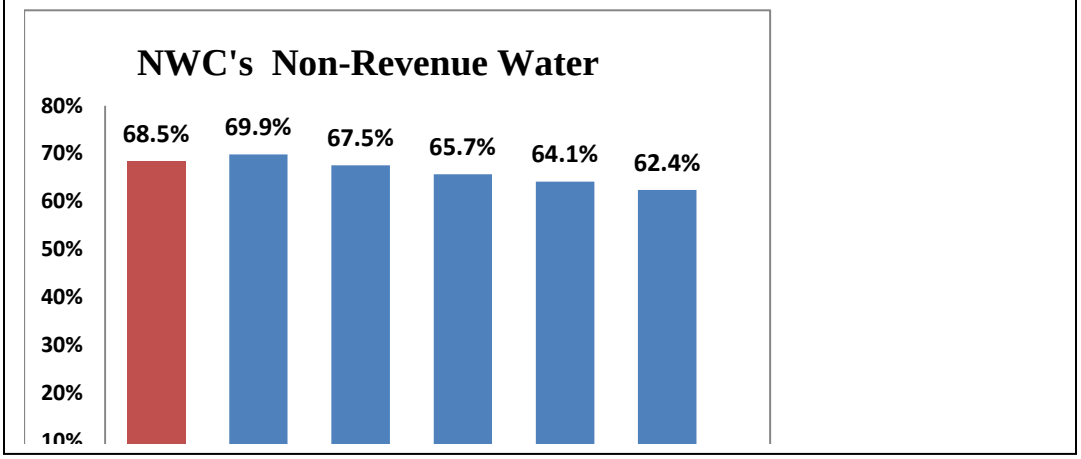
In the past, the NWC capacity to expand and introduce the technology necessary to improve efficiency and quality of service was severely impaired by a shortage of capital. It was in this context, the OUR approved an incremental tariff (K-factor) in its rates to

[18] See Thanassoulis, E, 2000.

augment the Commission's capital programme. The strategic deployment of capital is critical to the improvement of dynamic efficiencies and the OUR has made provisions in this Tariff Review K-factor funds to strengthen the NWC's capital expenditure programme.

The NWC's non-revenue water in the base year (2013) is expected to be 69.9% (See Figure 10.1 below). This compares with Trinidad and Tobago's 45%, Asia's 28.7% and 23.9% in North America (See Table 10.11below). Over the five year tariff review period, NWC proposes to reduce losses from 69.9% to 62.4% (See Figure 10.1). Admittedly, this signals an intention to reduce NRW; however, the planned reduction is not significant enough given the potential revenue impact on the Commission's operation.

Figure 10.1



Of the $12.2 billion K-factor expenditure made by the Commission over the previous five years approximately 78% was assigned to NRW projects. The OUR is of the view that given the high levels of NRW and the expected impact of NRW projects the NWC can achieve a loss target of 55% by the end of the tariff review period.

Table 10.11 – Non-Revenue Water Losses in Selected Countries

Country	Non-Revenue Water Loses (%)
Kenya (NCWSC)	45.0
Uganda (NWSC)	35.5
Burkina Faso (ONEA)	18.0
Senegal (SDE)	20.0
Tunisia (SONEDE)	16.7
Trinidad & Tobago	45.0
Singapore	5.0
North America	23.9
Asia	28.7
Jamaica	**69.9**

Sources: African Water Utilities Creditworthy Assessment Report (2008); Balkaran, C & Wyke, G .Managing Water Loss: Strategies for the Assessment, Reduction and Control of Non-Revenue Water in Trinidad and Tobago (OCCUR); Asian Development Bank, The Issues and Challenges of Reducing Non-Revenue Water; Lambert, A. et al. (2000) Water Loss Management in North America: Just how good is? New England Waterworks Association

10.14 Analysis

Static Efficiency

The log-linear regression yielded the following result:

Equation 7

$$\ln(OC_2) = -41.437 + 1.597\ln(NC) + 2.557\ln(Prd)$$

The two independent variables explained 64% of the O&M in US$ excluding electricity cost. *NC* and *Prd* were significant at the 1% and 12% level respectively.

When the Standard Length Factor was taken in to account the following equation was used to project NWC's total O&M cost over the tariff review period.

Equation 8

$$OC_2 = e^{-41.437}\,(NC^{1.597})(Prd^{2.577})(SLF^{0.289})$$

The regression model suggests that for every 1% increase in connections the NWC's O&M (excluding electricity) cost increases by 1.597%. Further, for every 1% increase in water production O&M cost (excluding electricity expense) rises by 2.577%. The Commission is therefore experiencing decreasing returns to scale contrary to the cost structure typically associated with natural monopolies. It is therefore evident that at present there are high levels of inefficiencies in NWC's operations.

Interestingly, the NWC non-energy O&M cost projections spanning 2013-17 are very aggressive. When compared to its current mode of operation as computed by the OUR's model, these projections indicate that the company will be improving the efficiency of its non-energy O&M by 3.7% in 2014 with heightened improvement in each successive year. In 2017, the final year of the tariff period the NWC projects a 14.5% efficiency improvement on the previous year (see Table 10.12 below). Undoubted these targets will be extremely challenging to achieve given the structural and behavioral changes required for a transformation of that scale.

Table 10.12 –NWC & OUR Projected O&M (without electricity) Cost

	Unit	2014	2015	2016	2017	2018
Projections Based on Current Efficiency	(US$'000)	133,951	164,002	201,944	248,986	307,528
NWC Projections	(US$'000)	118,027	152,981	164,305	175,138	184,859
OUR Projections After Efficiency Adj.	(US$'000)	133,951	151,821	172,939	197,114	224,910
NWC's Efficiency Index	-	100	93.3	81.4	70.3	60.1
NWC Efficiency Improvement on Previous Year		-	**-3.7%**	**-12.8%**	**-13.5%**	**-14.5%**
OUR Efficiency Index	-	100.0	92.6	85.6	79.2	73.1
OUR Efficiency Improvement on Previous Year			**-7.4%**	**-7.5%**	**-7.6%**	**-7.6%**

scale. In this regard, the OUR takes the position that the Commission should achieve cost elasticities for connections and production 1.581% and 2.549% respectively by 2017. These reductions could be achieved by greater efficiency in:

- Customer service delivery
- Metering operation
- Water production activities

As shown in Table 10.12below, the OUR's efficiency target is less aggressive that those in the NWC's projections. These improvements in the connection and production cost elasticities should result in an average annual cost reduction in non-electricity O&M cost of 7.5%.

It should be noted that in addition to static efficiencies to be gained from tighter management of resources employed in water production, the Commission stands to gain from the dynamic efficiencies to be derived from the lower cost trajectory associated with non-revenue water reductions not factored into the calculation.

Dynamic Efficiency

The two major sources from which the OUR expects dynamic efficiency gains are reductions in its electricity cost and improvements in revenue from the Commission's drive to reduce non-revenue water.

Among the strategies the NWC indicate it will be pursuing to reduce electricity cost are:

- Reinforcement and expansion of its pump and tank programme
- Pump replacement
- Power factor correction for pump motor drives

As discussed in Section 5.7 of this Determination the proposed initiatives to be undertaken by the NWC to reduce electricity cost should yield significant results (see Table 10.13). The expected average annual reduction electricity cost over the Tariff period is 6.8%.

Table 10.13 – NWC & OUR Projected Electricity Cost

	Unit	2014	2015	2016	2017	2018
Projections Based on Current Efficiency	(US$'000)	64,321	66,396	64,055	61,683	59,293
NWC Projections	(US$'000)	58,985	59,336	54,935	51,149	47,411
OUR Projections After Efficiency Adj.	(US$'000)	64,321	58,689	53,877	49,282	44,652
NWC's Efficiency Index	-	100.0	89.4	85.8	82.9	80.0
NWC Efficiency Improvement on Previous Year	**%**	-	-10.6%	-4.0%	-3.3%	-3.6%
OUR Efficiency Index	-	100.0	88.4	84.1	79.9	75.3
OUR Efficiency Improvement on Previous Year	**%**	-	**-11.6%**	**-4.8%**	**-5.0%**	**-5.7%**

With regards to non-revenue water the OUR has establish a water loss target of 55% by the end of the new tariff period. Annual reduction of 3.7 percentage points in the base year loss figure of 69.9% should ensure that planned target is achieved in 2017.

Table 10.14 shows the impact projected reduction in losses would have if it were fully converted to revenue. However, this is unlikely since losses attributable to leakages would impact production cost since the water was not being consumed in the first place. Secondly, where theft is involved and households are converted into legal customers the moral hazard associated with wastage is removed. Converted consumers are less likely to waste water they once obtained free since they are now obliged to pay. The potential average annual increase in revenue from fully converted losses is estimated to be 4.6% for the tariff period.

Table 10.14 – OUR Projected Revenue Impact of Non-Revenue Water Reduction

	Unit	2014	2015	2016	2017	2018
Revenue with NWC Target (US$'000)	(US$'000)	256,502	282,990	307,418	330,711	357,282
Revenue with OUR Target (US$'000)	(US$'000)	256,502	294,989	336,352	380,210	427,045
OUR Efficiency Index		100.0	104.2	109.4	115.0	119.5
OUR Efficiency Improvement on	**%**	**-**	**4.2%**	**5.0%**	**5.1%**	**4.0%**

Previous Year						
NWC Non-Rev Water Target	%	69.9%	67.5%	65.7%	64.1%	62.4%
OUR Non-Rev Water Target	%	69.9%	66.2%	62.5%	58.8%	55.1%

10.15 Total X-factor

Total revenue, electricity cost and O&M cost of a non-energy nature should all experience efficiency improvements over the Tariff Review period. However, while the projected efficiency gains may be quantified it is important to recognize that all of these items will not impact the Commission's revenue requirement to the same degree.

Firstly, each item's share in the total revenue is different and in this respect each item should be assigned a weight accordingly. For instance, O&M (non-electricity) cost is expected to exhibit an annual efficiency improvement of -7.5%, but by dint of the fact that it accounts for 5.6% of overall revenue its full efficiency impact would be -3.8%.

Secondly, the capacity of the Commission to translate the potential efficiency into actual benefits is also critical. Therefore, while the Commission may be able to reconfigure its customer service operation to reduce its O&M cost the full gains from its effort may not be realized because of resistance within the corporate culture. For example, a 40% translation of the annual expected efficiency improvement in O&M cost given its weight in the revenue requirement would have an overall impact of -1.5% (i.e. 0.4 x -3.8%). In this regard, the OUR is of the view that at a minimum NWC should be able to covert at least two-fifth of the potential efficiency gains identified, consequently each item shown in Table 10.15 is assigned a translation factor of 40%. The translation factor represents the percentage of full impact of the item under consideration that will be converted into efficiencies. As such, if the NWC is able to actual register a higher translation factor than those anticipated by the OUR the benefit will flow to the Commission's bottom line.

Based on the analysis of the potential for efficiency improvement in the Commission the X-factor over the 2013/14 -2017/18 Tariff period has been set at -4.0%. The resultant cumulative improvement in efficiency over the 5-year tariff period is estimated at 15.2%.

Table 10.15– OUR X-factor Components

Efficiency Type	Item	Avg. Annual Change	Share of Revenue	Translation Factor	X-Factor Component
Static	O&M Non-Electricity Cost	-7.5%	50.6%	40%	-1.5%
Dynamic	Electricity Cost	-6.8%	25.1%	40%	-0.7%
	Revenue	4.6%	100.0%	40%	1.8%
				X-factor	**-4.0%**
Cumulative Efficiency Improvement for Tariff Period (2013-17)					**-15.2%**

In addition, the OUR is of the view that the NWC should see greater levels of improvement in the earlier years of the tariff period. This assumption is reasonable in the context on expected diminishing marginal returns and given the level of K-factor expenditure in the previous period which is yet to be seen in the company's revenues and costs. Consequently, the incremental efficiency adjustment to the annual rate base has graduated in a declining fashion, starting with -5.5% in 2013 to -2.8% in 2017. Therefore the OUR has determined that X-factors over the period shall be as shown in Table 10.16 below.

Table 10.16 – OUR X-factor Determination

	2013	2014	2015	2016	2017
Annual Efficiency Adjustment to Rate Base	-	-5.5%	-4.4%	-3.4%	-2.8%
X-factor	-	**-5.5%**	**-9.7%**	**-12.7%**	**-15.2%**

10.16 K-factor application and recovery through X-factor

The Office has allowed the above K-factor programmes to be funded by the application of the K-factor.

- The X –factor is to be calculated as a deduction from the bill after the normal rates and PAM.
- The K-factor is to be calculated on the bill balance after the X-factor is deducted.
- Notwithstanding the above, the Office may make adjustments to the schedule two (2) years after its implementation to properly align cash inflows with financing requirements.
- NWC shall account for the deemed K-factor cash inflow calculated on the basis of 92% of the K-factor billing. A separate bank account shall be instituted to accommodate the cash flows from the K-factor and monthly report of balances and changes should be

submitted to the Office within forty-five (45) days of each reporting period. K-factor revenues shall be deemed collected within forty-five (45) days after billing

- The Office will issue further detailed guidelines on the operation of the K-factor Fund in a separate proceeding.

10.17 Path Programme for Water

The Office views this as a policy decision that is outside of the OUR's regulatory remit. The NWC is encouraged to explore the possibility of such a request with the relevant Government ministries.

10.18 Energy Surcharge

The Office is not in disagreement with the principle of applying an energy surcharge and note that NWC is entitled to make such a proposal. This would however require NWC to demonstrate that its system is able to allocate costs according to various parishes or geographical areas. NWC has provided the Office with no such information. It is therefore entirely within the NWC's discretion to submit a proposal substantiated by the relevant information for the Office's consideration. The Office will therefore not consider the application of an energy surcharge at this tariff review

10.19 Seasonal Tariff

As with the energy surcharge, the Office's position is that before it can consider the matter of a seasonal tariff, the NWC should provide a properly substantiated proposal to the Office. The Office will therefore not consider the application of a seasonal tariff at this tariff review.

10.20 Security Deposit

The Office has taken note of the NWC's proposal to begin charging customers a security deposit. Section 21 of the NWC Act, however affords the Commission significant options to secure payment of outstanding bills. The Office has therefore concluded that there is no need for the NWC to resort to a security deposit in order to secure payment.

10.21 Charges for delinquent and Inactive Customers

NWC has not provided the Office with information to indicate that these proposals have been taken beyond the stage of concept. Notably it is not even clear as to what is the definition of an inactive customer or how a delinquent account differs from one that would be liable for a late payment charge. The Office will therefore not approve a charge

for delinquent account or inactive account at this time. NWC may choose to provide better defined proposals supported by a charging regime at the next tariff review.

10.22 Late Fee

The Office will in principle approve the application of a late fee to be included in the Commission's tariff structure for the calendar year 2014/2015. The Commission is required to provide the Office with a detailed plan indicating inter alia: definition of late, applicable cost, mode of implementation and explanation of how this will relate to disconnection and the charge of a disconnection fee.

10.23 Reconnection and Disconnection Fee

The reconnection and disconnection fees to be applied by the commission remains unchanged and is outlined in Table 10.1 above.

10.24 Manufacturing rate for sewerage

The Office is mindful of the importance of the manufacturing sector to the Jamaican economy. This importance was also recognized by the Commission through the establishment of the EDWT, which encourages economic development by facilitating increased competitiveness, productivity and efficiency.

The Office is recommending that the NWC reinstate the sewerage rebate under the scheme. The Office is further directing the NWC to undertake a general review of the conditions under which the EDWT is applied to ensure equity within the sector and to eliminate any discrimination that may arise by its application to one entity and omission in another. This review should include consultations with stakeholders within the sector and shall be completed within the first three (3) months of this Determination.

CHAPTER 11: PERFORMANCE TARGETS

11.0 OPERATIONAL EFFICIENCY

11.1 Collection of Revenues and net receivables

The NWC has stated that it has implemented or is in the process of implementing its receivables management plan. Therefore, the Office is of the opinion that the collection rate for the NWC should be at least 92% throughout the tariff period. That is, bad debt should be 8% of billed revenues.

In addition to improving its collection rate the NWC should also focus on the timeframe within which it collects sums owed. Days of sales outstanding should be less than thirty (30) days by 2014.

11.2 Governance

NWC shall be required to improve its governance of the K-Factor programme and ensure that it is fully compliant with regulatory requirements. These regulatory requirements as it relates to the K-Factor programme will include standardised reporting formats and will be outlined in the Commission's Regulatory Framework.

11.3 K-Factor Project Approvals

The existing approved projects shall be completed by the NWC. No new projects will be approved for direct financing from the K-Factor fund until NWC provides a comprehensive assessment of the funding requirements to complete the existing approved projects and service the relevant loans.

11.4 Loan Financing

NWC shall be required to source loans to fund approved K-Factor Projects as against direct financing from K-Factor flows. The K-Factor fund is primarily to service loans contracted on the basis of anticipated K-Factor Flows.

11.5 International Monetary Fund (IMF) impact on NWC CAPEX

The Office has noted that the Government of Jamaica's (GOJ) letter of intent to IMF limits NWC CAPEX to J$10B in the 2013/2014 financial year. The Office is aware that this restriction in spending will have an impact on the K-Factor programme, as the NWC tariff submission, proposes CAPEX of at least J$15B for 2014. The Office directs NWC to redraft its CAPEX programme in line with the limit imposed.

11.6 Non-Revenue Water (NRW) Targets

In the tariff submission 2013-2018, NWC proposed to undertake a number of projects aimed at NRW reduction. In assessing the submission, it was observed that there were two categories to which all water projects were allotted (defined and undefined water project). The defined projects constituted projects that are identified in terms of the expansion works to be carried out as well as their expected results/benefits. The undefined projects referred to those for which a clear scope of activity has not yet been establish but general tone was set by indicating that there is a need to reduce NRW Island wide.

11.6.1 As it relates to the target for NRW, the Office is of the view that this is most conservative when examined against the outlay of investments allotted for projects aimed at reducing NRW over the tariff period. The Office has therefor formulated what it deems a more realistic target based on the approved defined projects and to lesser extent the undefined projects.

Table 14: Proposed NRW Targets over the Tariff Period -

	NRW Percentage (%)		
Parishes	As of December 31 2012	Targets from Approved K-factor Projects	Targets for the period (2014-2018)
Clarendon	**85.12**	**80.37**	**80.37**
St Catherine*	**69.46**	**33.70**	**33.70**
Kingston and St. Andrew	55.19	-	45.19
St. Thomas	78.86	-	68.86
Portland	65.90	58.53	58.53
St. Mary	72.90	58.80	58.80
St. Ann	71.18	-	61.18
Trelawny	75.84	-	65.84
St. James	66.62	-	56.62
Hanover	47.30	25.57	25.57
Westmoreland	69.65	41.89	41.89
St. Elizabeth	84.81	64.33	64.33
Manchester	71.74	-	61.74

Jamaica	68.17		55.59

*The project have already started

11.6.2 In Table 14, the parishes that are listed in **"Bold"** are those in which at least one specific project that was identified by NWC and approved by the OUR for K-Factor funding in which clear NRW target/impact was identified. The expected impact on NRW of those projects formed the basis of the OUR's approval and as such are relevant in examining NRW target for the new tariff period. Even though the targets were accepted for a particular project within a parish, there were other projects approved for the same parish and are expected to realise even further reduction of the respective parish NRW and by extension the overall NRW for the country.

11.6.3 For the other parishes there are numerous projects approved for each but at the time of approval, they were not submitted with expected benefits/targets. The Office's assessment is that with the combination of each of these projects within those respective parishes, there should be a minimum reduction of each parish NRW by 10% over this tariff period and has therefore determined a 55% NRW target for the tariff period.

11.6.4 The Office considers a target of 55% to be quite generous considering the amount of investments that has been approved and the amount that will be made available for the undertaking of the projects that are proposed in this submission. The Office is of the view that an efficient use of the investments and proper project management supervision will see the NWC comfortably achieving this target.

11.6.5 Quality of Service Performance Targets (2014 – 2018)

The Office has no objection to the NWC's proposal to replace the Overall Quality of Service Standards with the Quality of Service Performance Target (2014 – 2018). Some amendments are however, outlined below.

Objectives 5 & 6

The NWC proposes to improve, in percentage points, ranging from 25% to 60% its target in ensuring effluent quality. The Office takes the position however that any target that is set in relation to effluent quality must conform to the standards determined by the National Environment and Planning Agency (NEPA.).

Office Decision: Targets set for effluent quality must at a minimum conform to NEPA standards.

Objective 7

The Office is of the view that this objective, as stated, is contradictory. It states that to realize an improvement in water supply pressure, the NWC will **not** maintain water supply pressure in the range of 20 to 60 psi throughout the tariff period. However, for there to be an improvement in this area, the NWC needs to maintain water supply pressure within the range of 20 to 60 psi throughout the tariff period.

Office Decision: The Office has restated the objective as follows: Percentage of water supply maintaining a pressure in the range of 20 to 60 psi.

Objective 14

The NWC proposed to improve on its performance to repair leaks from 90% in the first three years of the tariff to 95% in the last two years of the tariff periods. The Office notes however that in the 2008 Tariff Determination Notice, the target set to improve on leak repairs was 90%. The Office is of the view that the target for the new tariff period has to be an increase on the one set for the previous tariff period.

Office Decision: The target set for the percentage of leaks repaired within three (3) days is 95% throughout the life of the tariff.

The Office underscores that the targets set above are specific targets proposed for the upcoming tariff period 2013/2018 and will be set out in the Commission's Regulatory Framework for the period 2013-2018.

Chapter 12: Regulatory Impact Analysis

12.1 The NWC stated that under the proposed tariff structure, water bill will rise. The Commission further explained that for a household consuming the current average quantity of 3,600 imperial gallons per month, their bills will rise by around 29% initially and then stabilize in real terms and gradually decline beyond 2016.

12.2 The Office believes that a more efficient and effective tariff structure during this tariff period is to delink water and sewerage services. However, it would be unduly expensive and not practical to measure the volume of sewage which leaves individual premises. Rather the sewage volume can be based on the amount of water provided to the premises. Since Jamaica has not yet developed an irrigation factor for water, it is assumed that sewage volumes are 100% of water volumes. Tables 12.1 and 12.2 below show the impact of the new rate regime on domestic customer's bills for various levels of consumption.

Table 12.1 Typical Residential Bill for customers with only water services

Typical Residential Customer bills			
	Current bill	New bill	Change
	$	$	
3000 gallons			
Service Charge	574	684	
Water charge	981	1170	
PAM	50.38	0	
X-factor	192.65	0	
K-factor	381.44	259.56	
Total bill	**1794.17**	**2113.56**	18%

7000 gallons			
Service Charge	574	684	
Water charge	3,340.00	3,976.00	
PAM	126.81	0.00	
X- Factor	484.90	0.00	
K-factor	960.10	652.40	
Total bill	**4,516.01**	**5,312.40**	**18%**

Residential customers' bills with only water services are to see an initial change of 18% over current bills in the initial year of the tariff. However in subsequent years, the Office believes that the Commission will experience some degree of efficiency and therefore an X-factor of -5.3% will be applied.

Table 12.2 Typical Residential Customer bill with water and sewage services

With Sewage	Current bill	New bill	Change
	$	$	
3000 gallons			
Service Charge	$574.00	$684.00	
Water charge	$981.00	$1,170.00	
Sewerage charge	$981.00	$1,059.00	
PAM	$82.17	$0.00	
X- Factor	$314.18	$0.00	
K-factor	$622.08	$407.82	
Total bill	**$2,926.06**	**$3,320.82**	**13%**

7000 gallons			
Service Charge	$574.00	$684.00	
Water charge	$3,340.00	$3,973.00	
Sewerage charge	$3,340.00	$3,604.00	
PAM	$235.03	$0.00	
X- Factor	$898.68	$0.00	
K-factor	$1,779.39	$1,156.54	
Total bill	**$8,369.74**	**$9,417.54**	**13%**

12.3 Operational Impact

The K-factor will address specific rehabilitation programmes designed to reduce the impact on the environment and improve efficiency.

- The Moratorium placed on the approval of new projects will ensure that the NWC completes specific projects that are important for the reduction of NRW, thus allowing the Commission to achieve the target NRW of 55%.
- An improved level of NRW will lower costs, increase revenues and delay the need for capital expansion.
- Almost all of NWC's wastewater treatment plants are in need of substantial rehabilitation. NEPA has submitted a list of plants that are in urgent need of attention in order to bring them into compliance with NEPA's effluent standards. The K-factor in the 2008 Tariff Determination Notice provided the cash flow to service the financing of the necessary capital works, this will be continued into the following tariff period
- The expansion of the collection network for sewage in the KSA will increase revenues and lower the per unit cost of treatment of the new wastewater treatment plant at Soapberry.

The implementation of water and sewage rate differential will also act as an incentive for customers to connect to the NWC's sewerage treatment facilities since sewerage rates are now cost reflective.

12.4 Environmental impact

Non-functioning wastewater treatment plants are a direct health hazard as untreated effluent is oftentimes discharged close to highly populated areas. In addition, damage to Jamaica's coastal environment may be permanent and as such may have a deleterious impact, if left unchecked, on the tourism product. The K-factor financed programme for the rehabilitation of sewerage plants will continue into the new tariff period. The NWC has suggested improving / upgrading a number of these projects.

12.2.4 Gender impact

Women are more affected by the lack of access to adequate water supply than men as they are the ones more likely to do the fetching from rivers to carry out domestic functions and other special needs for proper sanitation. An increased capacity of the NWC to carry out expansion programmes and to adequately serve existing customers will enhance the welfare of women. The new tariff provides the NWC with an increased level of financial sustainability while the NRW programme will recover additional capacity to serve new areas.

Chapter: 13: SUMMARY OF DECISIONS

13.1 The Office has determined that the effective increase of the NWC rates shall be nineteen (19%) in water rates and eight percent (8%) in sewerage rates.

The rates effective as at October 3, 2013 shall be as shown in Table 13.1below.

Table 13.1 Effective Rates

Rates and Charges	Effective rate inclusive of PAM April 2013	Effective Increase 2013/2014
Service Charges		
Where the size of the meter does not exceed		
5/8 inch/15mm	$574.86	$684.09
3/4 inch/20mm	$1,179.94	$1,404.13
1 inch/25mm	$1,543.05	$1,836.23
l¼ inch/30mm	$2,904.57	$3,456.43
1 1/2 inch/40mm	$2,904.57	$3,456.43
2 inch/50mm	$4,114.74	$4,896.54
3 inch/75mm	$7,473.21	$8,893.12
4 inch/100mm	$12,072.04	$14,365.73
6 inch/150mm	$18,395.47	$21,890.61
WATER RATES		
Domestic Consumers (Imperial Metered)—		
For up to 3,000 gallons at a rate of	$327.75	$390.02
For the next 3,000 gallons at a rate of	$577.81	$687.59
For the next 3,000 gallons at a rate of	$623.87	$742.41
For the next 3,000 gallons at a rate of	$796.29	$947.59
For the next 8,000 gallons at a rate of	$991.73	$1,180.16
Over 20,000 gallons at a rate of	$1,276.55	$1,519.09
Domestic Consumers (Metric Metered)—		
For up to 14,000 litres at a rate of	$72.06	$85.75
For the next 13,000 litres at a rate of	$127.06	$151.21
For the next 14,000. litres at a rate of	$137.20	$163.27
For the next 14,000 litres at a rate of	$175.12	$208.40
For the next 36,000 litres at a rate of	$218.07	$259.50

Over 91,000 litres at a rate of	$280.72	$334.05
Commercial and Industrial Consumers—		
Imperial metered	$1,229.00	$1,462.51
Metric metered	$270.22	$321.57
Condominiums—		
Imperial metered	$609.66	$725.49
Metric metered	$134.04	$159.51
Primary Schools—		
Imperial metered	$491.63	$585.04
Metric metered	$108.11	$128.65
SEWAGE RATES		
Domestic Consumers (Imperial Metered)—		
For up to 3,000 gallons at a rate of	$327.75	$353.97
For the next 3,000 gallons at a rate of	$577.81	$624.04
For the next 3,000 gallons at a rate of	$623.87	$673.78
For the next 3,000 gallons at a rate of	$796.29	$860.00
For the next 8,000 gallons at a rate of	$991.73	$1,071.07
Over 20,000 gallons at a rate of	$1,276.55	$1,378.67
Domestic Consumers (Metric Metered)—		
For up to 14,000 litres at a rate of	$72.06	$77.83
For the next 13,000 litres at a rate of	$127.06	$137.23
For the next 14,000. litres at a rate of	$137.20	$148.18
For the next 14,000 litres at a rate of	$175.12	$189.13
For the next 36,000 litres at a rate of	$218.07	$235.51
Over 91,000 litres at a rate of	$280.72	$303.18
Commercial and Industrial Consumers—		
Imperial metered	$1,229.00	$1,327.32
Metric metered	$270.22	$291.84
Condominiums—		
Imperial metered	$609.66	$658.43
Metric metered	$134.04	$144.76
Primary Schools—		
Imperial metered	$491.63	$530.96

Metric metered	$108.11	$116.76
MISCELLANEOUS FEES		**Effective 2013/2014**
Disconnection and Reconnection Fee—	$798.00	$798.00
Domestic Unmetered Services (Locked)	$3,547.00	$3,547.00
Removal and Replacement of Service		
(Unmetered)	$798.00	$798.00
Domestic Metered Service (Locked)		
Domestic Metered Service Removed	$7,099.00	$7,099.00
and Replaced ~/s inchll5mm and		
% inch/2Omm		
	$10,652.00	$10,652.00
Domestic Metered Service Removed and		
Replaced 1 inch/25mm and over	$798.00	$798.00
Commercial Metered Service (Locked)		
	$10,652.00	$10,652.00
Commercial Metered Service Removed and Replaced		
Illegal Connections, Domestic and		
Commercial, the actual cost of		
Leak Detection and/or Repair, the actual cost of		

13.2 Price Adjustment Mechanism

The PAM formula is as follows:

PAM=[w_fe*ΔFE+w_cpi*ΔCPI+w_ec*Δkwh]

Where,

ΔFE is the percentage change in the J$/US$ exchange rate;

ΔCPI is the percentage change in the Consumer Price Index;

Δkwh is the percentage change in the kilowatt hour charge for electricity;

w_fe is the weight associated with J$/US$ exchange rate;

w_cpi is the weight associated with the Consumer Price Index; and

w_ec is the weight associated with the kilowatt hour charge for electricity;

The Office has determined that the weights for the PAM are as shown in Table 13.2 below.

Table 13.2: Effective PAM weights

Index	Current Weight	NWC Proposed Weight	OUR Determined Weight
CPI	47%	31%	51%
Electricity	25%	13%	25%
Foreign Exchange	28%	4%	24%
Salary		15%	0%
Asset Revaluation		36%	0%
Total	**100%**	**100%**	**100%**

The Office has also determined that all the indices are to be applied on a monthly basis. The PAM will also be reset at its anniversary at which time the new base values for the 3 components will be set. The annual reset for PAM (ANPAM) will be based on the following formula:

$ANPAM = [w_{fe}*\Delta FE + w_{cpi}*\Delta CPI + w_{ec}*\Delta kwh]*100$

where w_{fe} is the weight for foreign exchange, w_{cpi} is the weight for CPI and w_{ec}, the weight for kwh and

Δ is the percentage change in the respective variables, that is, new base value of each variable less the old base value.

In light of the foregoing, the new PAM formula will remain unchanged.

$$PAM = \left[w_{fe} * \Delta FE + w_{cpi} * \Delta CPI + w_{ec} * \Delta kwh\right] * 100$$

The base values for the PAM indices are chosen as at July 2013 and are as shown below

Electricity $31.41/kWh;

Exchange Rate J$101.76 to US$1.00; and
CPI All divisions 200.9.

The PAM will also be reset at its anniversary (1st August) at which time the new base values for each component will be set. The rates at the beginning of each year shall be derived by Base rate*(1 +ANPAM ±Z).

13.3 K- Factor Application and Recovery through X-Factor

The Office has allowed the above K-factor programmes to be funded by the application of the K-factor:

The X –factor is to be calculated as a deduction from the bill after the normal rates and PAM

- The K-factor is to be calculated on the bill balance after the X-factor is deducted
- Notwithstanding the above, the Office may make adjustments to the schedule two years after its implementation to properly align cash inflows with financing requirements.
- *NWC shall account for the deemed K-factor cash inflow calculated on the basis of 92% of the K-factor billing. A separate bank account shall be instituted to accommodate the cash flows from the K-factor and monthly report of balances and changes should be submitted to the Office within forty-five (45) days of each reporting period. K-factor revenues shall be deemed collected within forty-five (45) days after billing*

Table 13.3 below outlines the applicable K-factor and X-Factor variables

Table 13.3 Applicable K-Factor and X-Factor percentages

Year Ending March	2014	2015	2016	2017	2018
K-Factor	14%	14%	14%	14%	14%
X-Factor	-	-5.5%	-9.7%	-12.7%	-15.2%

13.4 Manufacturing Sector – Economic Development Wastewater Tariff (EDWT)

The Office is recommending that the NWC reinstate the continuance of the sewerage rebate under the EDWT. The Office is further directing the NWC to undertake a general review of the conditions under which the EDWT is applied to ensure equity within the sector and to eliminate any discrimination that may arise by its application to one company and omission in another. This review should include consultations with stakeholders within the sector and shall be completed within the first three (3) months of this Determination.

13.5 Path Programme for Water

The Office views this as a policy decision that is outside of the OUR regulatory remit. The NWC is encouraged to explore the possibility of such a request with the relevant ministries.

13.6 Energy Surcharge

The Office is not in disagreement with the principle of applying an energy surcharge but has no basis for approving one in this tariff.

13.7 Seasonal Tariff

The Office is not opposed to consider a seasonal tariff but has not been provided with a basis for doing so in this review.

13.8 Security Deposit

The Office has concluded that there is no need for the NWC to resort to a security deposit in order to secure payment.

13.9 Charges for delinquent and Inactive Customers

NWC has not provided the Office with information to indicate that these proposals have been taken beyond the conceptual stage. The Office will therefore not approve a charge for delinquent account or inactive account at this time. NWC may choose to provide better defined proposals supported by a charging regime at the next tariff review.

13.9.1 Late Fee

The Office will in principle approve the application of a late fee to be included in the Commission's tariff structure for the calendar year 2014/2015. The Commission is required to provide the Office with a detailed plan indicating inter alia: definition of late, applicable cost, mode of implementation and explanation of how this will relate to disconnection and the charging of a disconnection fee.

13.10 Reconnection and Disconnection Fee

The reconnection and disconnection fees to be applied by the Commission remain unchanged and are outlined in Tables 13.1.

13.11 Quality of Service Standards

The following Guaranteed Standards become Effective on October 3, 2013:

Table 13.5 Effective Guaranteed Standards

CODE	FOCUS	DESCRIPTION	PERFORMANCE
WGS1	Access	Connection to supply	Maximum time of ten (10) working days to connect supply and install meter after establishment of contract. **Compensation type: Claim**
WGS2	Delivery of bills	Issue of first bill	Maximum time of forty (40) working days after connection of supply and installation of meter. **Compensation type: Claim**
WGS3	Appointments	Keeping appointments	Must make and keep an appointment at customers request and must notify customer within reasonable time prior to appointed time, if the appointment will not be kept. **Compensation type: Claim**
WGS 4(a)	Complaints	Acknowledgement	Maximum of five (5) working days to acknowledge customer written complaints, after receipt. **Compensation type: Claim**
WGS (4b)	Complaints	Investigations	Maximum time of thirty (30) working days from the date receipt of the complaint to complete investigation and respond or provide

CODE	FOCUS	DESCRIPTION	PERFORMANCE
			an update. **Compensation type: Claim**
WGS 5	Disconnection	Wrongful Disconnection	Where the NWC disconnects a supply that has no overdue amount or is currently under investigation by the OUR or the NWC and only the disputed amount is in arrears. **Compensation type: Automatic**
WGS 6	Account status	Issue of account status	Meter to be read on same day customer is moving, if on a weekday (within two (2) working days of move if on a weekend) providing five (5) working days' notice of move is given. Maximum time of fifteen (15) working days to provide final bill after move and forty-five (45) days to refund credit balances. **Compensation type: Claim**
WGS 7	Water meters	Meter installation	Maximum of thirty (30) working days to install meter on customer's request. **Compensation type: Claim**
WGS 8	Water meters	Repair or replacement of faulty meters	Maximum time of twenty (20) working days to verify, repair or replace meter after defect is identified or reported. **Compensation type: Automatic**
WGS 9	Water Meters	Changing Meters	NWC must provide customer with details of the date of the change, the reading on the old meter on the day and serial number of the new meter. **Compensation type: Claim**
WGS 10	Water meters	Meter reading	Should NOT be more than two (2) consecutive estimated bills (where company has access to meter). **Compensation type: Automatic**
WGS10(b) **(NEW)**	Water Meters	Exceptional Meter Readings	Where consumption increases by at least fifty percent (50%), then the customer is to be alerted within one billing period.

CODE	FOCUS	DESCRIPTION	PERFORMANCE
			Compensation Type: Claim
WGS11	Reconnection	Reconnection after payment of overdue amount	Current: Maximum of twenty-four (24) hours to restore supply. **Compensation type: Automatic**
WGS12	Reconnection	Reconnection after wrongful disconnection	NWC must reconnect a supply it inadvertently disconnected within eight (8) hours of being notified of the error. **Compensation type: Automatic**
WGS13	Compensation	Payment of compensation	Maximum of thirty (30) working days to process and apply credit to customer's account. **Compensation Type: Automatic**
WGS 14 **(NEW)**	Estimation of Consumption	Method of Estimation	An estimated bill should be based on the average of the last three (3) actual readings. **Compensation type: Automatic**
WGS 15 **(NEW)**	Billing Adjustment	Timeliness of adjustment to customer's account	Where necessary, customer must be billed for adjustment within three (3) months: (i) identification of error, or (ii) subsequent to replacement of faulty meter **Compensation Type: Claim**

13.12 Compensation Mechanism

The Office has determined that the compensation for breach of a Guaranteed Standard will be four (4) times the applicable service charge.

Where applicable, customers must submit claims within one hundred and twenty (120) working days after the breach is committed.

3.13 Special Compensation

In the case of Reconnection after payment of Overdue Amounts, Wrongful Disconnection and Reconnection after Wrongful Disconnection, the compensation will be six (6) times the applicable service charge.

Breaches of individual standards will attract compensation up to six (6) periods of non-compliance.

13.14 Mid-tariff Review

The Office will be conducting a mid-tariff review on the Guaranteed Standards Scheme.

ANNEX 1

Table A1: Proposed K-factor CAPEX Projects (2014-2018)

Project Type	Project Name	Final Year	Total (US$ mn)	2013	2014	2015	2016	2017	2018
Energy Efficiency Projects	KMA Water Supply Improvement Project Energy Efficiency	2017	8.26	0.12	8.14	0	0	0	0
Sewerage Projects	CReW - Caribbean Regional Fund for Waste wastewater Management Phase 1	2016	11.58	3.68	3.32	4.5	0.08	0	0
	Wastewater Treatment Plants Rehabilitation - K Factor	2019	35	0	1	4	15	10	5
	Rationalization and expansion of sewage network in KSA - North	2021	39	0	1	1.5	1.5	15	20
	Rationalization and expansion of sewage network in KSA - Sector F	2015	8.1	2	5	1.1	0	0	0
	Portmore Sewerage Reconfiguration Project	2016	23.65	0	12.13	10.9	0.62	0	0
	Harbour View WWTP Phase II&III	2015	4.9	0	4.2	0.7	0	0	0
Sewerage /NRW Reduction Projects	Kingston Water and Sanitation Project (KSA) Phase 1 - Mona & Hope WTPs. Construction of Darling Street PS	2017	4.58	4.58	0	0	0	0	0
NRW Reduction Projects	Jamaica Water Supply Improvement Project (JWSIP) Category 'B'	2015	52.43	19.95	22.73	9.75	0	0	0
	KMA Water Supply Improvement Project -	2017	50.91	5.53	15.3	10.44	9.72	9.93	0

	KSA NRW Reduction								
	KMA (JICA) Water Supply & Rehabilitation Project	2014	8.17	8.17	0	0	0	0	0
	K-FACTOR – NRW Reduction Projects Island-wide ** (Undefined/Semi-Defined)	2022	140	0	23	47	50	10	10
	GRAND TOTAL, US$million		386.58	44.03	95.82	89.89	76.92	44.93	35
	GRAND TOTAL, J$billion		39.431						

Table A2: K-Factor Completed Projects and Expenditure as at July 31, 2013

Type	PROJECT NAME	Total
Sewerage Projects (15 Projects)	Washington Blvd Rd. Widening Project (NWA)	13,537,172
	Waterloo Road Sewer Expansion Project	17,259,113
	Twickenham Park WWTP	61,538,045
	Salisbury Avenue Sanitary Collector	26,328,441
	Mountain Terrace/Nannyville Sanitary Collector Sew	25,264,009
	Western Sewage Treatment Work - KSAT	44,653,667
	EU Negril/Ocho Rios WWTP	59,445,309

	Sewering Ruthven Rd/Trafalgar Road	3,818,516
	Cedar Valley/Widcombe/Ravina Sewerage	86,892,182
	Paddington Terrace Sanitary Collector Sewer, St. A	32,311,234
	Wiggan Loop	45,857,607
	Hopefield Avenue	485,656
	Montego Bay Sewerage Project - North Gully	50,911,768
	Musgrave Avenues Sewers - KSAT	3,607,252
	Mona Road Sanitary Sewer Extension	14,532,422
	TOTAL COMPLETED PROJECTS - SEWERAGE	486,442,392
Wastewater Projects (16 Projects)	Christianna/Spaulding W/S (Spaulding/Limit) Package A K-actor	24,721,162
	Christiana/Spaulding W/S (Limit/Sedburgh) - Package B, K- Fa	27,829,096
	Christiana /Spaulding W/S (Christiana to Sedburgh)	24,490,051
	Jamaica Water Supply Improvement Proj CAT; A	5,311,211,038
	Jamaica Water Supply Improvement Proj CAT; A+	995,759,912
	May Pen W/S / Woodside to Guinep Tree	35,072,973
	Kellits/Crofts Gate W/S Rehab. Clarendon	16,026,487

	Christiana/Spaulding (Limit to Mitzpah)	17,409,955
	Christiana/Spaulding (Tweedside to Pecham)	55,556,133
	Birds Hill/chateau	18,368,704
	Coopers Hill Steel Tank (Rehab)- St. Andrew	7,277,598
	Mammee Bay W/s -St. Ann	14,792,572
	Luana - Sandy Ground/Brompton Water Supply	8,398,970
	Clarks Town to Duncans Pipeline Project - K- Factor (BP7283)	48,740,037
	Free Hill Water Supply - West St. Mary	2,550,202
	North Western Parishes W/S Contract #2 (Martha Bra	118,326,637
	TOTAL COMPLETED PROJECTS - NRW REDUCTION	6,726,531,527
	TOTAL COMPLETED PROJECTS (31)	7,212,973,919

Annex 2

Table A3: Proposed Operational Target

No	Objective	Critical Measures	Unit	Definition	Min/ Max.	Targets				
						2013-14	2014-15	2015-16	2016-17	2017-18
1	Reduce losses	Percentage of Non-Revenue Water	%	*System Input Volume-* *Billed Authorized Consumption* *System Input Volume*	Max	68%	66%	64%	62%	61%
		Reduce NRW		NRW as % of Production (Max)		60%	55%	50%	50%	50%
2	Reduce losses	Volume of Non-Revenue Water	IG/conn/day	*System Input Volume* *Billed Authorized Consumption* *(Total Number of Active Water Connections EoY) • 365*	Max.	315	292	272	252	233
3	Improve Billing	Metering Level	%	*Number of Water Connections with Functioning*	Min.	84%	85%	85%	86%	87%

				Meter EoY Total Number of Active Water Connections EoY						
		Functioning Meters	%	Accounts with Functioning Meters/Total Accounts				90%	90%	90%
4	Improve Billing	Percentage of Meters Read	%	*Number of Meters Read Total Meters*	Min.	92%	95%	97%	97%	97%
		Percentage of Meters Read in each Billing Cycle (Min)		Number of Meters Read/Total Meters		97%	97%	97%	97%	97%
5	Improve Billing	Collection Rate	%	*Collected Revenue Billed Revenue*	Min.	87%	87%	88%	90%	90%
		Collection Rate		collected Revenue/Billed Revenues		95%	95%	95%	95%	95%
6	Improve Billing	Days of Sales Outstanding	days	*Net Accounts Receivables EoY Billed Revenue 365*	Max.	50	50	50	50	50
		Days of Sales Outstanding (Max.)		Accounts Receivables/Total Credit Sales * Number of Days					45	45
7	Increase Staff Efficiency	Staff Efficiency Water	#/'000 W conn	*Number of Total Employees EoY Number of Water Connections EoY*	Max.	5.6	5.3	5	4.8	4.5

				(in'000)						
		Staff Efficiency (Max.)		Number of Water and Sewage Employees/Number of Water Connections (in1000)					4.5	4.5
8	Increase Staff Efficiency	Staff Efficiency Sewage	S#/'000 S conn	*Number of Sewage Employees EoY Number of Sewage Connections EoY (in'000)*	Max.	2.3	2.1	2	1.9	1.8
9	Increase Energy Efficiency	Energy Efficiency	MWh/IG	*Total MWh Consumption System Input Volume*	Max.	3	2.8	2.6	2.3	2.1

Table A4: Proposed Financial Target

No.	**Objective**	**Critical Measures**	**Unit**	**Definition**	**Max / Min**	**Targets**				
						2013-14	**2014-15**	**2016-17**	**2017-18**	**2018/19**
1	**Profitability**	**Profit Margin**	%	*Net Profit (Loss) of the Year/ Revenues (P&L)*	Min.	**0%**	**3%**	**8%**	**11%**	**7%**
		Net Profit Margin (Min)		Operating (loss) profit/Revenues (P&L)		5%	7%	9%	9%	

2	**Profitability**	**Return on Equity**	%	*Return on Equity* / *Equity Base Previous Year*	Min.	**0%**	**7%**	**14 %**	**16 %**	**16%**
3	**Efficiency**	**EBITDA Margin**	%	*EBITDA* / *Revenues (P&L)*	Min.	**33 %**	**36 %**	**41 %**	**45 %**	**44%**
4	**Liquidity**	**Quick Ratio**	ratio	*Current Assets - Inventories* / *Current Liabilities (including current portion of long - term debt)*	Min.	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
		Quick Ratio		Current Assets-Inventories/Current Liabilities		1	1.1	1.2	1.2	1.2
5	**Bankability**	**Debt Service Coverage Radio**	ratio	*EBITDA* / *Debt Repayment +Interests*	Min.	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
6	**Gearing**	**Debt Radio**	**%**	*Total Adj. Liabilities* / *Total Adj. Liabilities + Adj. Equity*	Max.	**55 %**	**55 %**	**55 %**	**55 %**	**55%**

Annex 3

A5: Approved K-Factor Projects as at July 31, 2013

Project Name	Estimated Cost ($M)
Kingston Metropolitan Area (KMA) Water Supply and Rehabilitation Project - NRW Reduction Component	390.89
North Western Parishes Project	410
Port Antonio Water Supply Sewage and Drainage	475.3
Mamme Bay Water Supply System	73.68
Birds Hill Water Supply Project	87.45
Brucefield to Babury Hill	30.05
Malborough to Berry Hill	49.64
Coopers Hill Potable Water Welded Steel Tank	8.23
Ruthven Road Collector Sewer	23.8
Hopefield Avenue Sanitary Sewer	50.76
Jamaica Water Supply Improvement Project - Pipeline Network components	3614.07
Kellits Water Supply Rehabilitation and Upgrade	23.94
Dalintober to Sandy Ground	17.92
Luana to Sandy Ground	10.05
Georgia to Silversand	49.87
Clarks Town to Georgia Mains Replacement	229.58
Victoria Town CrossKeys: Grove Town to Smithfield Pipe Replacement	33
Hounslow Water Supply and Upgrade (Extension to Fort Charles)	167.34
Greater Mandeville Water supply	429.99
Forest Hill Mains Replacement	30.45
Dornoch to Baron Hill Water Supply	79.27
Pipeline Replacement - Inhouse (St Mary and Portland)	38.74
Kingston Water and Sanitation Project	1800
Production Metering - Phase 1	129.6
Consumer Metering Installation	825
Data Collection for Pipeline Networks	62.27

Wiggan Loop Sanitary Collection Sewers	29.82
Twickenham Park Wastewater Treatment Plant	210
Western Treatment Works - Diversion Sewer	34
Cornwall Court Water Treatment Plant Replacement - Cornwall Court/Montego Bay Sewerage	353.07
Sanitary Collection Sewers Barbican Road/Cedar Valley/Standpipe Lane/Ravinia/College Green	41.63
Mona Road Sanitary Sewer Extension	18.22
Hope Road Street Sewers	73.45
Constant Spring Sewers	393.07
Paddington Terrace Collector Sewer	35.85
Sewerage of Seymoure Lands/Trafalgar Park/New Kingston - The construction of Fair View/Seymoure/Retreat Avenue Collector Sewer	37.04
Mona Plaza/Old Hope Road Sewer	22.25
The Rehabilitation of the Mountain Terrace/Nannyville/Independence Park/Stadium Gardens/Swallowfield Sanitary Collecor Sewer	30.24
Essex Valley Water Supply-Pipeline Replacement	224.76
Woodside to Guinep Tree	107.78
Seville Water Supply – Tank Replacement	17.83
Santa Cruz Water Supply Phase 1B	74.71
Negril Ponds Rehabilitation	77.83
Waterloo Road Sewer Expansion Project	18
Harbour View Sewage Treatment Rehabilitation	702.65
Washington Boulevard Sewer Expansion Works	3
Pipeline Replacement – Inhouse #2	58.89
Salisbury Avenue Collector Sewer	42.7
Christiana/Spaulding - Tweedside to Pecham	75.32
Christiana/Spaulding - Limit/Cobla/Mizpah	40.87
Christiana/Spaulding - Spaulding/Limit	40.87
Christiana/Spaulding - Limit/Sedburgh	43.01
Christiana/Spaulding - Christiana/Sedburgh	35.91
Derry Hazzard Water Supply	3.001

Rehabilitation of a Section of Warminster Avenue Collector Sewer	8.641
Washington Boulevard Sewer Expansion Works – Phase 2	6.43
Swallowfield Road Sanitary Collector Sewers	23.04
Sandhurst Crescent Mains Replacement	12.12
Rehabilitation of the Old Hope Road Sanitary Collector Sewer	12.48
Mona Road (Extension) & Roads Leading Off Sanitary Collector Sewers	53.565
Coopers Hill Potable Water Welded Steel Tank – Phase 2	16.625
Hope High Level - St Andrew	10.3
Melrose Mews –Manchester	10.4
Mount Royal Estate Housing Development -St Catherine	10.2
Norwood - St James	11.2
Parklee/Mountainside-St James	10.4
Phoenix Park Housing Development – St Elizabeth,	10.4
Prospect Pen – St Thomas,	10.3
Sherwood Content – Trelawny,	8.6
Chichester Shettlewood Water Supply - Hanover	19.4
Birds Hill/Chateux/Palmers Cross (Additional Works)	2.46
Downtown Kingston Sewerage (Darling Street WWTP)	1633.345
Jamaica Water Supply Improvement Project - Category A: Additional Works	893.54
Yallahs Wastewater Stabilization Ponds	46.48
Fruitful Vale Water Supply Improvement	7.46
Barbican Road/Cedar Valley/Standpipe Lane/Ravina/College Green [Extension]	24.2
Lady Musgrave/Montrose/Upper Montrose road Sanitary Collector Sewers	76.03
Duhaney Park Sewage Force Main	55.15
Browns Town and Greater Browns Town (Minnards) Pipeline Replacement (St Ann)	221.4
Lot F Downtown Kingston Sewerage Extension	745
Whitehouse Pipeline Replacement	207.9
Palisadoes Peninsula Pipeline Replacement	206.15
KMA Water Supply Rehabilitation Project – Lot 2B	1465.16
Roaring River/Savanna-la-Mar and Greater Savanna-la-Mar Water Supply	1685.28
Tanks and Pump Rehabilitation for Operational Efficiency	640

Non-Pariel Water Supply Mains Replacement and Upgrading	444.54
Burnt Savanna/Knoxwood Water Supply Mains Replacement and Upgrading	59.96
Mason River/Kellits/Sandy River Water Supply Scheme	202.31
Black River and Greater Black River Pipeline Replacement	493.37
Old Harbour and Greater Old Harbour Water Supply	43.89
Eastern Westmoreland Water Supply Upgrading	80.68
Duhaney Park Sewage Force Main (Gravity Sewer Pipeline Repair Component)	32.579
Western Hanover Water Supply	678.025
Mount Pleasant and Environs Water Supply	257.57
Lucea Pipeline Replacement Project	1,733.07
Jamaica Water Supply Improvement Project - Cat B (Rio Cobre Pipeline Replacement - US30.653M)	3,126.44
Jamaica Water Supply Improvement Project - Cat B (Customer Metering Initiative - US$21.141M)	2,156.27
Jamaica Water Supply Improvement Project - Cat B (Norwood&Ewarton-Linstead - US$8.133M)	829.52
Agualta Vale Supply Mains Replacement & Upgrading	839.43
Essex Valley Water Supply Phase 2 (Nain to Junction)	255.88
Total	31,363.85

ANNEX 4

National Water Commissions – Guaranteed Standards Explanatory Notes

- **WGS 4(b) – Response to Complaints**
  Where the investigation into a complaint is not completed within the specified 30 working days, then the Commission will not be in breach of this standard if written updates are provided to the customer at least once every 30 working days until the final written response is provided.

- **WSG 5 – Wrongful Disconnection**
  The Commission commits a breach where it disconnects a customer's supply that has no overdue amount reflected on the associated account. This standard will also apply to accounts that are under investigation by the OUR or the Commission and on which the company is requested or has undertaken to place a hold on the disputed sum but disconnects the account prior to the OUR's or its own ruling on the matter and there were no outstanding sums owed beyond the disputed sum.

- **WGS 10(b) – Exceptional Meter Readings**
  The Commission commits a breach if it obtains a meter reading which indicates an increase in consumption of at least 60% and does not alert the customer.

- **WGS 14 – Estimation of Consumption**
  An estimated bill should be based on the average of the last three (3) actual readings. This standard makes exception for the first 6 bills of new accounts <u>ONLY</u> if three (3) actual readings are not available within that period.